FIRST·BOOKS·OF·SCIENCE

COMMERCIAL GEOGRAPHY

T. ALFORD SMITH, B.A. (Lond.), F.R.G.S.

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A FIRST BOOK OF COMMERCIAL GEOGRAPHY

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A FIRST BOOK OF COMMERCIAL GEOGRAPHY

BY

T. ALFORD SMITH, B.A. (LOND.), F.R.G.S.

SENIOR GEOGRAPHY MASTER, ST. DUNSTAN'S COLLEGE, CATFORD

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PREFACE.

In the first part of the book (Chapters I.-VII.) important articles of commerce are described and some account is given of the conditions under which the articles are produced and the processes by which the raw materials are turned into manufactured articles.

In the second part (Chapters X.-XVI.) the trade of the United Kingdom is dealt with in order to show what goods we obtain from foreign countries and from British possessions and what articles we send to these countries.

The statistics throughout the book have been taken from "The Statesman's Year-Book," the publications of the Board of Trade, etc. In all the statistical tables average values and average quantities are given; consequently the figures differ very slightly from those of any particular year. The lists of Imports and Exports in the three Appendices are intended for reference only; it should be noted that, with few exceptions, those articles are called *Principal* Imports (or Exports) the average values of which exceed half a million sterling.

Thanks are due to the Editors of the Series for many valuable suggestions; thanks are also due to the Controller of H.M. Stationery Office and to the Union of Lancashire and Cheshire Institutes for permission to print questions from Examination Papers.

T. ALFORD SMITH.

St. Dunstan's College,
Catford, S.E., *September*, 1914.

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ARTICLES OF COMMERCE AND TRADE ROUTES.

INTRODUCTION.

Commerce is the exchange of commodities; and commercial geography describes these commodities in order to show the part played by man both in producing them and in trading with them.

In all ages, men have engaged in commerce for the sake of material gain; the search for wealth has induced them to navigate unknown seas in hopes of finding rich countries for trade; it has impelled men to risk their lives in the frozen regions of the north, and in the unhealthy swamps of tropical lands. All parts of the earth's surface are now more or less known, and men are therefore directing their efforts with a view of developing the resources of those parts of the world which already yield some amount of wealth. By means of improved methods of cultivation men try to make a fertile district more productive than before; by means of irrigation they try to make an area deficient in rain bring forth crops; in order to increase the supply of a particular article they transplant trees to other parts of the world; and in order to get a larger profit they improve machinery for particular processes.

As a consequence of these various developments, trade tends to follow certain routes from the productive areas to the great markets of the world. Traders compete more and more with each other in order to gain a greater share of the

world's commerce. Improved methods of transport, such as railways, fast steamships, etc., and greater facilities for obtaining information (by telegraph, telephone, etc.) all help to increase the possibilities of trade.

In order to understand Commercial Geography it is necessary to know:

(*a*) where an article is produced and why it is produced there; that is, the distribution of the article in the world and the conditions under which it is produced;

(*b*) what processes (if any) it has to undergo in order to become an article of commerce;

(*c*) by what means it is transported to a particular place, either for manufacture or for consumption; and

(*d*) in the case of a manufactured article, what becomes of it after the processes of manufacture.

Distribution of products.—**Minerals** are widely distributed over the earth's surface; the distribution is independent of climatic conditions and of man's control. Wherever the mineral is found man will work it if he can obtain and transport it in a profitable way.

With regard to **plants**, man can control the distribution within certain limits, *e.g.* the eucalyptus tree, a native of Australia, has been transplanted to Southern Italy and India; the cinchona, a native of South America, has been transplanted to the slopes of the Himalayas.

Climatic conditions.—The conditions under which articles of commerce derived from plants are produced are chiefly those relating to soil, temperature and rainfall. The variation in natural vegetation is very marked in passing from the Equatorial lands to the Polar regions, and a similar variation is met with in ascending the slope of a lofty mountain. In one case the variation is due to latitude; in the second case to elevation. For example, in equatorial lands, grow tropical jungle, palms, rubber, and teak; in sub-tropical regions, evergreens such as myrtle and olive; in temperate

lands, deciduous trees (oak, elm, beech, etc.) and grass; in north temperate lands, the pine, fir and larch; and within the Arctic circle, mosses and lichens; beyond this there is ice and snow with no vegetation.

On a mountain side the same series will be met with; but the elevation at which each belt occurs will vary according to the direction of the slope, *e.g.* on the south side of the Alps, the level at which snow remains unmelted is much higher than it is on the north side. It is therefore important to know not only the latitude but also the elevation at which a plant or tree grows.

Taking the various climatic conditions into account, it is possible to divide the great land masses of the world into **regions** which resemble each other in climate and vegetation. Among others may be mentioned the following types—the Mediterranean, Monsoon, Continental, Marine, Plateau, Desert, etc.

Processes.—Some products are found in nature in a state ready for use as articles of commerce; they need no preparation, *e.g.* ivory found on the frozen plains of Northern Siberia; this ivory is the remains of the mammoth and elephant which once lived in this region. Most articles, however, require some preparation before they can be treated as articles of commerce: for example, raw sugar must be extracted from the sugar cane; raw cotton must be separated from the cotton seeds; wheat must be threshed to get the grain from the straw, and so on. These processes are usually performed at or near the place of production in order to save the cost of carriage.

Transport.—Many products have to be carried from the areas of production to an industrial district for manufacture or to a densely populated area for consumption. For purposes of transport to the coast, use is made of pack animals, human porters, river boats, and, in more highly developed districts, of railways. When the products reach the coast

they have to be shipped and carried by ships across the ocean to distant lands.

Raw cotton from the Southern United States is exported from New Orleans (or other cotton port) to Liverpool to be manufactured on the South Lancashire coalfield. After various processes of manufacture, the cotton goods which have been made from the raw material are exported to lands

FIG. 1.—A caravan of camels crossing the desert.

which have no textile industries, such as Manitoba, British South Africa and New Zealand.

Iron ore, brought from Bilbao in Spain to Middlesbrough is smelted there, and, from the pure metal, steel is prepared and manufactured into machinery. The machinery is exported in large quantities to British colonies or to foreign countries: for instance, steam ploughs and threshing machines are wanted in the wheat-growing districts of Manitoba or of South Australia; gold crushing machines in the Transvaal or Western Australia.

Food products, such as wheat, frozen mutton, etc., are usually consumed in the countries to which they are sent.

Growth of Towns.—Commercial activity has an important effect on towns. Towns grow up near the sources of natural wealth, such as Johannesburg, near the Witwatersrand: or on productive areas where markets are required for the produce of the surrounding districts, *e.g.* Winnipeg.

FIG. 2.—Native porters carrying packages on their heads through a tropical swamp.

Along trade routes towns increase in importance as railway centres, river ports, and in certain circumstances great seaports grow up at the place of shipment and at the place of unloading, that is, at the points where land traffic and sea traffic meet.

In industrial districts towns tend to increase both in numbers and in size, for a large population finds a means of livelihood within a restricted area.

EXERCISES.

1. What is Commercial Geography? Why do men engage in commerce?

2. Show that the commercial importance of a country depends to some extent on the climatic conditions. Give examples.

3. How is it that the commerce of the world has developed so greatly during the last hundred years?

4. State the circumstances which have led to the growth of towns in modern times; give examples to illustrate the answer.

CHAPTER I.

WHEAT AND OTHER CEREALS.

1. The United Kingdom produces every year about 30 million cwts. of wheat, and imports about 98 million cwts. The imported wheat comes from the following countries:

SOURCES OF IMPORTED WHEAT.

Country.	Month of Harvest.	Wheat. 1000 cwts.	Wheatmeal and Flour. 1000 cwts.
United States of America -		17,419	7,337
Southern States - -	June		
Northern States - -	July		
Argentine - - - -	January	22,287	100
British India - - -	Feby. and March	11,833	6
Australia - - - -	January	9,445	386
Canada - - - -	September	16,287	2,124
Chile - - - - -	January	1,505	—
Russia (in Europe) - -	July	17,311	6

Draw a circle (radius 4 inches) to represent the amount of wheat imported into the United Kingdom. Divide the circle into sectors to show the proportion of wheat imported from the countries in the table. The remaining sector to be marked other countries.

2. On an outline map of the world mark (1) the chief wheat-producing areas, and (2) the routes by which wheat is brought to the United Kingdom.

Wheat.—Wheat is cultivated chiefly in temperate and sub-tropical latitudes; it is the most widely distributed of all the cereals, and in no part of the world does it grow wild. Wheat was unknown in the New World at the time of its discovery; now it is cultivated very extensively both in the United States and in Canada.

The **conditions favourable** to wheat growing may be considered under the following headings:

Temperature.—Wheat requires a higher temperature than oats, rye, or barley; for at least a month before harvest, the mean temperature should be not lower than 60° F.

Rainfall.—A moderate rainfall in the spring is necessary when the seeds are germinating and the young shoots are coming up. Very heavy rains are injurious, while thunderstorms are in some cases destructive to the crop. Wheat is often cultivated on the margins of arid regions, especially where markets are close at hand.

Sunshine.—Sunny weather is required to ripen the wheat. Tropical heat scorches the grain and spoils its quality; in temperate regions the wheat ripens slowly, during the long days of summer, hence the further north it can be grown the more favourable is this condition.

Soil.—The soil must be stiff enough to support the ear-topped stalk, and so a soil with an admixture of clay, or a light calcareous soil, is most suitable for wheat.

Slope.—Good wheat lands should slope sufficiently in order to provide natural drainage; if the land is very flat, artificial drains must be put in, and this involves considerable labour and expense. Field machinery can, however, be used to great advantage on level and undulating ground, especially on large areas.

Wheat Production. Europe.—Europe produces more wheat than any other continent; it is extensively grown on the central plain of Europe and on the plains of Lombardy and Hungary. The only European countries which raise all the

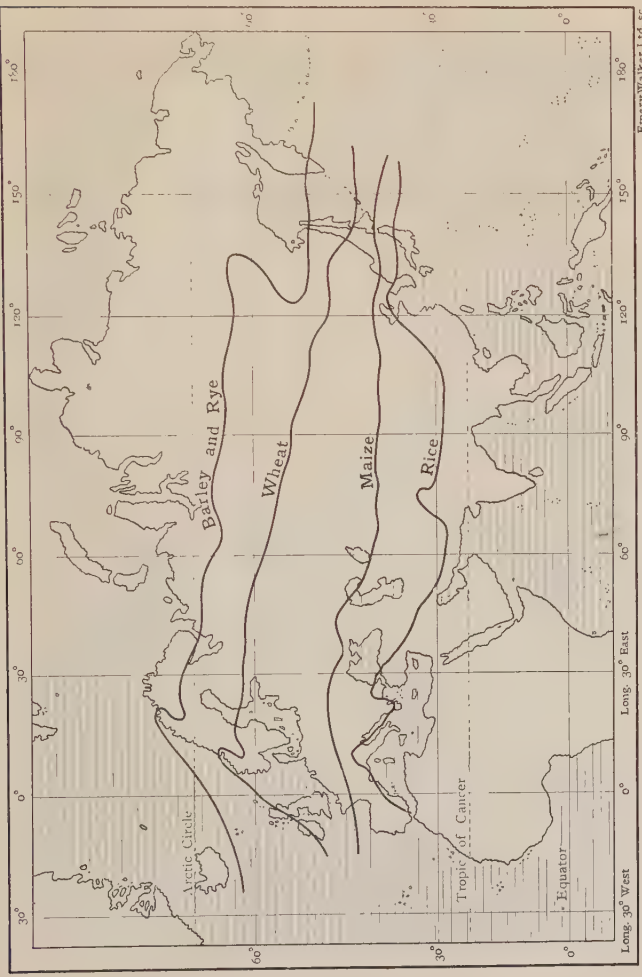

FIG. 3.—Northern limit of cereals.

bread-stuffs they require are Russia, Austria-Hungary, and the Balkan States.

In Great Britain wheat is grown chiefly in the eastern counties, where the climate is dry and bright. The limit of cultivation is determined by excess of rainfall; in the western parts of Great Britain there is too much rain in the ripening season; in the Highlands of Scotland the low summer temperature prohibits wheat growing.

On the Black Earth of Southern Russia immense quantities of wheat are raised. Some of the wheat is sent up the rivers for consumption in Russia, while a still greater part is sent to Black Sea ports for export.

The superior quality of Hungarian flour is largely due to the climatic conditions under which the wheat grows, as well as to the care with which it is cultivated and to the up-to-date methods of milling.

Asia.—In India, wheat is grown chiefly in the Punjab and the North-West Province. Irrigation is often necessary because the rainfall is insufficient just when it is required. The wheat ripens in the cool season, the harvest month being February or March; it is therefore a winter crop, and at this season the temperature in Northern India is about the same as the summer temperature in Minnesota (U.S.A.). The wheat farms in India are small, for land is dear; modern machinery is rarely used. Most of the wheat is sent down the Indus valley to Karachi for export.

In Southern Siberia, on the lands near the Trans-Siberian Railway, wheat is being cultivated; this region has nearly the same latitude as Manitoba, and the climatic conditions of the two districts are very similar. At present the settlement of Southern Siberia is incomplete, but the region is likely to become one of the great wheat-producing areas of the world.

Manchuria and North East China are possible sources of supply in future; at present, transport is somewhat difficult, and the ground is required for other crops.

Photo Underwood & Underwood.

FIG. 4.—An American wheat field and reaping machine.

In **North America**, the present westward limit of wheat-growing is approximately the line of 20 inches annual rainfall; good wheat has been grown as far north as Fort Simpson on the River Mackenzie (800 miles north of Winnipeg). The land suitable for wheat is of enormous area and the number of inhabitants is relatively small, hence land is cheap but it requires capital to work it. The finest district in North America for wheat growing is the valley of the Red River, which is partly in Canada (Manitoba) and partly in the United States (North Dakota and Minnesota). The cultivated area consists of deep, pulverised soil, rich in organic matter, and so, although little manure is used, 25-30 bushels of wheat per acre are often obtained.

There are two varieties of wheat, known respectively as spring and winter (sown) wheat. In the northern wheat lands winter wheat is most largely grown, the seed being protected by the covering of snow.

The chief operations in connection with spring wheat are:—

(*a*) *ploughing*, which begins in October and continues for several weeks;

(*b*) *sowing*: the ground is covered with snow during the winter; in March the snow begins to melt, and in April the fields are first harrowed, and then the seed is sown, mostly by mechanical press drills;

(*c*) *reaping*: towards the end of July the harvest begins; one reaping machine will cut the wheat on a hundred acres in a day. On many farms the wheat is threshed on the fields, the average yield being 18-20 bushels per acre;

(*d*) *transport*: the wheat is carried by rail to the great elevator centres, such as Winnipeg, Duluth, Port Arthur, St. Paul, Chicago, Buffalo, etc. The wheat is handled in bulk, and on the rivers and lakes grain steamers of great size carry the wheat to Montreal or other towns for export.

Minneapolis is the largest milling centre in the world; in recent times the flour-milling industry has been revolutionised

by the substitution of iron and porcelain rollers for the old millstones. This change has proved to be most effective in the case of the hard wheat grown in this region.

Argentine.—During the last twenty years large tracts of

Photo Underwood & Underwood

FIG. 5.—Grain elevators on the Great Lakes. The barge belongs to Buffalo.

grass land have been brought under cultivation, and wheat fields now cover more than nine million acres. The wheat area is confined chiefly to the States of Santa Fe, Buenos Aires, Cordoba, and Entre Rios. The average yield per acre is about twelve bushels. Enormous quantities of wheat

are exported to Europe, especially from the ports of Buenos Aires and Rosario. As the harvest is in January, Argentine wheat reaches this country in the month of March or April.

Australia.—Wheat was first grown in the coastal districts, but it can be grown over any portion of the arable lands that have twenty to forty inches of rain a year, provided that some of this rain falls during the period of early growth.

The chief wheat lands are in Victoria, South Australia, and New South Wales. The average yield is only about ten bushels per acre, but with scientific farming this yield should be doubled.

Rye.—Rye is the only cereal, besides wheat, that can be used to make bread. Rye grows on poor sandy soil, and it thrives in the inhospitable climate of the Baltic region. Rye, or black, bread is cheaper than wheaten bread, but it is not so nutritious; it is, however, an important article of food for the peasants of Russia, Germany and Scandinavia.

In **Russia**, the greatest rye-producing country, not only is bread made from rye but a well known spirit, vodka, is prepared from it.

In **Great Britain**, rye is cultivated as a forage crop for cattle and horses; it is sown in the autumn to be used in spring after the root crops have been gathered.

In the **United States** rye is largely grown for the sake of the straw, which is used for packing purposes and in making paper and pasteboard.

Barley.—Barley is hardier than wheat, growing in colder and drier regions, but it is cultivated most extensively in the wheat areas. In Norway, barley grows as far north as latitude 70° and it also grows in sub-tropical countries like Algeria; on mountain slopes it grows higher than any other cereal.

On rich soils barley grows too rapidly and the grain is coarse and uneven; light calcareous soils suit it best, and the yield is often 36 bushels per acre. The seed is usually

sown in March or April, and the drill is preferred to broadcast sowing.

The chief use of the grain is to obtain malt for brewing.

Oats.—Oats can be cultivated over a wider range of latitude and on a greater variety of soils than wheat. Oats are grown in parts of the United States and in the north and

Fig. 6.—Field of maize.

west parts of the British Isles where the summer is too damp and too cold for wheat cultivation; in Russia, Germany, Denmark and Scandinavia enormous quantities are raised every year.

Oats are chiefly used as a valuable food for horses and cattle; oatmeal and groats are prepared from oats for human food.

Maize.—Maize is the only grain crop indigenous to the New World; in North America it is known as *Indian corn* (or corn); in Hungary as *Turkish wheat*; in South Africa as *mealies*.

The range of cultivation extends from 50° N. to 40° S.; within the tropics it flourishes at a higher altitude than in sub-tropical lands. It is essentially a summer crop, and during the ripening period it requires a high temperature both by day and night, and moderate rain is also necessary during the period of growth. Countries which have dry summers (*e.g.* California, Southern Italy) are unsuited to maize. In England the summer is not sufficiently long, warm, and sunny for maize cultivation on a large scale, but a little is grown for feeding cows and other cattle.

FIG. 7.—Maize—Corn cob.

The greatest maize-growing country is the United States, where the total production is nearly four times that of wheat. The corn belt includes the states of Nebraska, Iowa, Kansas, Missouri, Illinois, Indiana and Ohio.

In Mexico, maize is the chief food of the people. It is also extensively cultivated in the Argentine, Austria-Hungary, Rumania, Lombardy.

Maize is grown in all these countries, because

(i) of its prolific yield; one acre of maize yields twice as much grain as one acre of wheat;

(ii) it can be used in such a variety of ways (*a*) as human food: in the United States the green unripe maize is eaten as a vegetable (*corn cobs*); *corn flour* and *hominy* are made from it; in Italy maize meal is known as *polenta*;

(*b*) as food for cattle—the greatest meat packing industry of the United States is carried on in the centre of the corn belt;

(*c*) glucose, starch and alcohol are all prepared from the grain.

Rice.—Rice can only be cultivated in tropical and sub-tropical lands, where high summer temperatures prevail and where the cultivated areas are well supplied with water. Rice therefore grows best in the monsoon countries of south-

Photo Underwood & Underwood

FIG. 8.—Natives gathering rice.

east Asia, and especially on the great river deltas and low-lying coast lands which are subject to inundation during the summer rains; lands artificially irrigated also produce rice.

The seed is usually sown broadcast, although in some districts young seedlings are transplanted after a few weeks of growth. The yield of rice is great in comparison with

the amount of land under cultivation, hence rice-growing regions support dense populations.

In Bengal, two rice harvests are obtained, and frequently two crops from the same field. Hill rice grows on the drier soils of upland districts in India up to a height of 8000 feet above sea level, but the quantity grown is small.

Rice is the staple food of the people in Japan, Philippines, Java, and Indo-China ; in India, however, only about one-third of the people depend on rice for food. The dense population of Northern India consumes nearly all the rice that is grown, and so there is little for export. Lower Burmah is the least densely populated of the rice-growing regions, and from Rangoon large quantities are exported to Europe. In India, rice in the husk is known as paddy, and in Japan the national beverage saké is made from rice.

In Egypt, rice is grown in the alluvial soils, which are covered by the annual overflow of the Nile, and on the Plain of Lombardy rice thrives on the irrigated fields.

Rice cultivation has been introduced into America, and is carried on with success on the coastlands and river lowlands of Louisiana, Texas and Arkansas ; in these states the most improved machinery is employed both in the fields and in the mills.

EXERCISES.

1. Compare the conditions under which wheat is grown in North America with the conditions in India and Egypt.

2. Compare the conditions under which rye and maize are grown in Europe.

3. In what countries are rye and rice respectively the staple food of the people? Give reasons.

4. The following cereals are imported into the United Kingdom from European countries :—

IMPORTATION OF CEREALS FROM EUROPE.

	Wheat. 1000 cwts.	Barley. 1000 cwts.	Oats. 1000 cwts.	Rye. 1000 cwts.	Maize. 1000 cwts.	Flour. 1000 cwts.
Russia	17,311	9,182	6,451	428	3,185	6
Germany	184	202	2,944	132	—	520
Rumania	915	2,210	429	—	4,623	47
Turkey	27	207	65	—	56	—
Austria-Hungary	—	335	—	—	—	161

Write down the name of the country from which we get the greatest quantity of each cereal in the above table. In each case give some explanation. Which of these cereals grow south of latitude 45° in Europe and which north of that line?

5. In the table on page 7 the month of harvest is given for the countries from which we obtain wheat. Of what advantage is it to us that the harvest takes place at different times of the year?

6. Write notes on the following:—glucose, paddy, polenta, vodka, mealies.

7. Say what you know of the cultivation of (*a*) barley, (*b*) oats. What are the chief uses of these cereals?

8. On an average, Canada produces 175,567 thousand bushels of wheat every year; the United States 716,359 thousand bushels.

CHIEF WHEAT-PRODUCING STATES.

State.	Area. 1000 sq. miles.	Wheat. 1000 bushels.	State.	Area. 1000 sq. miles.	Wheat. 1000 bushels.
Manitoba	252	51,705	Nebraska	78	49,392
Saskatchewan	252	83,887	Indiana	36	32,724
Alberta	255	18,706	Ohio	41	26,534
Kansas	82	76,497	Illinois	57	30,054
Nth. Dakota	71	82,398	Missouri	69	30,292
Sth. Dakota	78	39,130	Washington	69	40,930
Minnesota	85	77,238			

In the case of each state, find the number of bushels per square mile. Mark the states on a map of North America; shade darkly the six states which produce most wheat per square mile; shade the other states very lightly.

CHAPTER II.

SUGAR, TEA, COFFEE, COCOA.

1. Examine the subjoined table and write down the most important facts contained in it. What do you understand by (*a*) refined, (*b*) unrefined sugar?

On an outline map of the world mark (1) the countries which produce cane sugar, (2) those which produce beet sugar.

IMPORTATION OF SUGAR INTO THE UNITED KINGDOM.

Sugar (Refined).		Cane Sugar (Unrefined).	
Country.	Value £1000.	Country.	Value £1000.
Germany	5,034	British West India Is.	501
Austria-Hungary	2,728	British Guiana	298
Netherlands	2,243	Mauritius	397
Russia	902	British India	347
Belgium	860	Java	1,699
France	620	South America (Peru, Brazil, Dutch Guiana)	897
Total from all countries	13,370	Total from British possessions	1,554
		Total from Foreign countries	4,037

Beetroot Sugar (Unrefined).

Country.	Value £1000.	Country.	Value £1000.
Germany	3,205	Austria-Hungary	998
Netherlands	297		
Belgium	251	Total from all countries	4,874
France	23		

2. The successful production of tea as an article of commerce is confined to a strictly limited area (5° S. to 35° N., and 67° E. to 140° E.)

On an outline map enclose this area and within it mark clearly the districts where tea is grown. Shade lightly any districts outside this area in which tea is produced, and find out the conditions for each of them.

Kinds of Sugar.—The important kinds of sugar are obtained from the sugar cane, the sugar beet, and the maple tree.

Cane Sugar.—The sugar cane was probably first cultivated in the monsoon region of south-east Asia, and from this

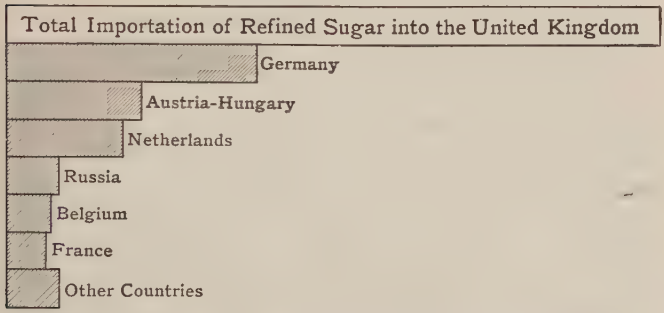

FIG. 9.—Refined sugar; the diagram is drawn from the values given in the above table.

region it was introduced in the middle ages into Egypt, Sicily and Spain. In the sixteenth century the Spaniards took it to the West Indies and to Central America.

The sugar cane thrives in tropical and sub-tropical lands. It grows as far north as latitude 37° in Spain and as far south as latitude 30° in Natal. It requires a high temperature and abundance of moisture, hence it can be cultivated with success in India, Java, Cuba, Jamaica, Guiana and other lands in which tropical rains and tropical heat prevails. It also grows well in Louisiana on the flood plain and delta of

the Mississippi, and in Hawaii, where irrigation can be carried on easily.

The sugar cane grows to a height of 10 15 feet, and, as a rule, the canes are cut annually from roots which remain in

Photo Underwood & Underwood

FIG. 10.—Sugar cane being brought to the mills.

the ground. After the canes have been cut they are taken to the crushing mills, in which the rollers are now fed with canes by mechanical means. To the juice which has been squeezed from the canes, lime is added in order to precipitate

any impurities in it. The clear liquor is run off into vacuum pans, in which it is evaporated, leaving behind **sugar crystals** and **molasses**. The crystals thus obtained are known as **raw sugar**, and this is exported in large quantities to Great Britain and the New England States of America, where it undergoes several processes in the sugar refineries before it is sold for household use. From the molasses **rum** is manufactured.

For a considerable time the cane sugar industry was injured by the abolition of slave labour in the West Indies and by the competition of beet sugar. Recently, however, the manufacture of cane sugar has increased in volume. This increase is largely due to improved methods, which result in more profitable work. The various processes of manufacture are also carried on in central factories, with machinery of large capacity, while hand-work is confined almost entirely to the agricultural part of the industry.

Beet Sugar.—The sugar beet is grown in the North Temperate zone between latitude 46°-56°, especially in Germany, France, Austria-Hungary and some parts of the United States. It can be grown in the Eastern counties of England, as the climatic conditions are suitable, but at present very little is grown.

Before the nineteenth century, beet sugar was scarcely known. During the Napoleonic wars great encouragement was given to the production of beet sugar on the Continent in order to prevent cane sugar from British colonies entering the markets of Europe. In the last fifty years the production of beet sugar has increased enormously, because of (*a*) bounties given to the manufacturers, (*b*) more care in cultivating the beet, (*c*) improved methods of abstracting sugar from the roots.

Out of one hundred tons of beetroot, twelve tons of sugar can now be obtained. The juice is no longer squeezed or pressed from the beet, but it is obtained by a method called

the **diffusion process.** After the roots have been sliced by machinery, they are put into cells into which warm water flows; the juice of the beet mingles with the water and it is run off into tanks (the pulp which remains behind in the cells is used as food for cattle). The juice is then treated with lime and filtered and, as in the case of cane sugar, the clear fluid is placed in a vacuum pan and evaporated, and two products are left, namely, **molasses** and **sugar crystals.** By passing the crystals or unrefined sugar through animal charcoal all traces of colouring are removed, and from the clear white syrup thus produced the refined sugar of commerce is obtained.

FIG. 11.—Sugar beet.

Maple sugar is prepared from the sap of the maple tree. It is produced in Canada and the United States, but the quantity is small, and so maple sugar is of little commercial importance.

Glucose is a liquid sugar, produced in the United States from corn starch, in France and Germany from potato starch. It is used in confectionery, and for mixing with molasses in the manufacture of table syrup.

Tea.—From very early times the tea plant has been cultivated in China and Japan. During the nineteenth century the cultivation of tea was extended to Assam (where a species of the tea plant grows wild), to Southern India, Ceylon and Natal. Tea is also grown in Java and on the southern slopes of the Caucasus.

Cultivation and preparation of tea.—Tea is the dried leaf of an evergreen bush; it is one of the hardiest of sub-tropical

plants, growing as far north as latitude 35°. Frosts check its growth and diminish its yield, but do not kill it; it is, however, injured by excess of moisture settling about its roots. The tea plant grows best in light soils where the land is well-watered and well-drained. It thrives on the hill sides of monsoon lands where there is no long drought, and where the heat of summer is tempered by the altitude at which it grows (often up to 7000 feet).

In **India and Ceylon**, the plants are raised from seed, and are planted out in rows two or three feet apart. If the plantations are not well sheltered, quick growing trees, such as eucalyptus or cinchona, are planted to protect the tea shrubs from storms.

Fig. 12.—The tea plant.

In the third year the first leaves are picked, and three crops a year can often be gathered; the life of a well-cared-for bush has been estimated at fifty years. In Northern India the picking season begins in April, and in some districts continues to December; this work is done chiefly by women and children. The leaves are dried, and then rolled by machinery in order to crush the leaves and to set free any juices in them. After this the tea is packed carefully for exportation.

Black tea and **green tea** are prepared from leaves of the same plant, the difference in colour being due to the variation in the method of treating the leaf. Great Britain is the greatest consumer of black tea, the United States of green tea.

In **China** tea growing is a garden culture, and hand labour is employed both in the fields and in the various branches of preparation. China teas are chiefly exported by land routes to Russia (especially in the form of tablets), Tibet, Persia, etc., and by sea green tea is sent to the United States.

FIG. 13.—Gathering tea in Ceylon.

In India and Ceylon the tea plantations are large in extent, and machinery is employed in many of the curing processes. In British markets India and Ceylon teas have almost supplanted China teas; this is due to some extent

(*a*) to the conservative methods of the Chinese;

(*b*) to the enterprise of tea planters and merchants in India and Ceylon;

(*c*) to the change in taste, in consequence of which consumers now prefer the stronger and blacker teas of India and Ceylon.

Enormous quantities of black tea are brought to Great Britain *via* the Suez Canal. London is the chief centre of the tea trade.

In **Java**, tea grows on the higher slopes of the hills, coffee lower down, and on the swampy lowlands rice and sugar thrive well.

Green tea is prepared in large quantities in **Japan** for export to the United States of America.

Coolies from India are employed on the tea plantations of **Natal**, but nearly all the tea raised in that colony is consumed in South Africa.

Tea is grown in small quantities in California and some of the Southern States of America for home consumption; in many of these States the conditions are favourable to its growth, but it is not cultivated extensively because of the high price of labour.

Coffee.—The coffee tree grows wild in Abyssinia, but in south-west Arabia, near Mocha, it has been cultivated for many centuries. The fruit of the tree is a fleshy berry, not unlike a small cherry, and each fruit contains two seeds embedded in a yellowish pulp. The plants begin to bear fruit in the third year of growth; in Brazil they are at their best when 10-15 years old, although they continue to yield fruit for more than thirty years. The conditions under which coffee is cultivated are somewhat similar to those for tea, except that coffee thrives in slightly hotter districts, and winter rains are not essential. The regions best adapted for coffee are well-watered mountain slopes within the tropics from one thousand to four thousand feet above sea-level and having a mean annual temperature 65°-70° F. Coffee is never grown far from the tropics, as the crop is injured by frost.

Preparation of Coffee.—The primitive method (still used in Arabia) of drying the fruit in the sun as soon as it is picked is no longer practised in the great producing areas.

In Brazil and the West Indies the fruit is placed in tanks of water until the fleshy portion is reduced to a pulp; the seeds are then taken out and dried, after which they are passed through rollers so that the parchment between the seeds may first be broken and then removed by winnowing. After this the beans are graded according to size and quality, and packed in bags ready for export. The processes of roasting and grinding are usually done in or near the place of consumption in order that the aroma of the coffee may be preserved.

Fig. 14. Branch of coffee tree.

Brazil is the greatest coffee-growing country; it produces nearly three-quarters of the world's supply. The coffee plant was not introduced into Brazil until the beginning of the nineteenth century. It is grown on the cooler highlands of the Atlantic provinces of Brazil, and its cultivation has made **Rio de Janeiro** the commercial centre of Brazil. Railways in Brazil were constructed in the first place to carry coffee to the coast, especially to Rio and to Santos.

Coffee is also largely cultivated in Central America, in the West Indies, in Southern India, and in the Dutch East Indies.

In Ceylon the cultivation of coffee has declined because of a fungus disease which attacked the leaves of the plant

Liberian coffee is noted for its large berries and for the heaviness of the crop. It grows on unsheltered low ground in equatorial Africa, and it is not readily attacked by fungus.

The Netherlands and the United States of America are the greatest coffee consuming countries of the world. The consumption of coffee per annum in the United Kingdom is only one pound per head of the population; in the Nether-

Fig. 15.—Cacao tree with seed pods (South America).

lands the consumption is 14 lbs. per head: in the United States 11 lbs., Germany 6 lbs., France 5 lbs.

Cocoa.—The word cocoa is a corruption of *cacao*, the name of a tree which grows in tropical countries where there is constant heat and abundant moisture. The tree grows best

in the valleys and lowlands of equatorial regions. In Ecuador, the chief plantations are within two or three degrees of the equator, and the cocoa beans are sent by river or rail to Guayaquil for export. In Mexico there are some plantations near the Tropic of Cancer. Cocoa is also grown in Venezuela (near Caracas), Colombia, Trinidad, Hayti, and in São Thomé or St. Thomas (an island in the Gulf of Guinea), the Cameroons, and in Ceylon.

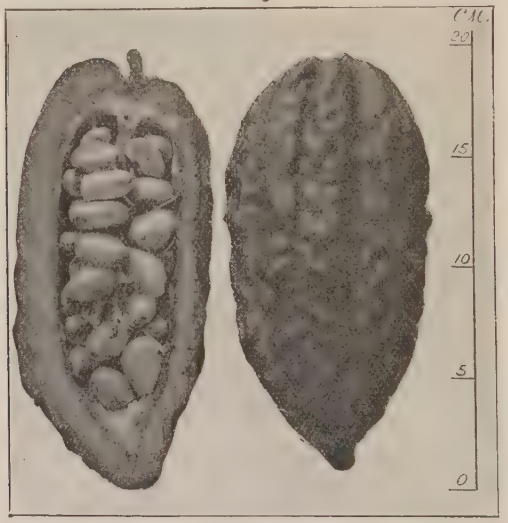

FIG. 16.—Cacao fruit, showing seeds in the pod.

Cocoa was known in Europe early in the sixteenth century, that is, before the introduction of tea or coffee to European markets. It is still consumed in large quantities as a beverage in Spain and Portugal, and it should be noted that in nearly all the areas of production the planters are descendants of Spanish or Portuguese settlers.

The fruit of the cacao tree consists of a fleshy pod which contains thirty to fifty seeds; from these seeds fat, called

cacao butter, is obtained, and this is eaten by the natives of tropical America.

The seeds or beans are first fermented for five to seven days by being placed in a heap with plantain or other green leaves in order to destroy the power of germination in the seeds and to prevent mustiness. After this process is completed the beans are dried in the sun and then packed up for shipment. In the cocoa factories the beans are roasted and split open ; the fatty substances are removed and various preparations of chocolate are then made either for drinking or for eating.

EXERCISES.

1. Describe the processes by which tea, coffee and cocoa are respectively prepared for use.

2. In what countries are tea, coffee and cocoa respectively consumed as beverages? In the case of each country give a reason why the beverage is used.

3. Why does beet sugar compete so successfully with cane sugar in the markets of Europe?

4. Describe the methods by which refined sugar is obtained from beet and cane respectively.

5. How is it that London is the chief centre of the tea trade?

CHAPTER III.

FISHERIES.

1. Draw a sketch map of Western Europe; mark the chief fishing areas and the towns connected with the fishing industry.

2. On an outline map of North America mark the following fisheries:—Cod, herring, sturgeon, seal, whale.

Fisheries.—In many countries fishing provides an important article of food, and the industry is pursued more or less by all peoples who live on coast lands. In the North Temperate Zone, **cod** and **herring** are the two most important fish used for food; they are caught in the greatest numbers off Western Europe and off the North-east coast of North America.

Western Europe.—Off Western Europe fishing is chiefly carried on in the shallow seas of the continental shelf, especially on the banks which surround the Lofoten Isles and on the Dogger Bank in the North Sea. Steam trawlers have increased the range of fishing from the Strait of Gibraltar to the White Sea. Norway, Netherlands, France and Great Britain are the chief countries engaged in fishing, but the British fisheries are more valuable than those of all the rest of Europe put together.

Cod Fishery.—In December and January the cod is caught on the banks round the Lofoten Islands; later it moves southwards along the coast of Norway, past Bergen into the North Sea, where it is caught on or near the Dogger

Bank. In order to catch the cod, long lines, with baited hooks attached, are let down into the water. When the lines are drawn up, some of the fish are killed at once and packed in ice; some of the cod are placed alive in wells or tanks (filled with sea water) in the boats, so that the fish may be kept to supply the markets regularly.

FIG. 17.—Cod fishing—Note the fish caught with hooks attached to lines.

When the cod is brought to port, some is sent to market fresh; some is packed in barrels with salt; and some is salted and hung up to dry, after which it is called **stock fish**. From the liver of the cod, **oil** is extracted, the **roe** is used for bait in other fisheries, and **isinglass** is prepared from the bladder. The chief towns for the cod fishery are **Grimsby** in Lincolnshire and **Bergen** in Norway; from Bergen the Roman Catholics of Southern Europe get the chief supply.

Herring Fishery.—Shoals of herring are not found as a rule north of Bergen; off Bergen the fishery is carried on in

the spring of the year, but as the shoals move south, June and July are the fishing months for Wick fishermen, July and August for the Peterhead and Aberdeen fleets, August and September for Grimsby and Yarmouth. The herring is chiefly caught by means of **trawling**; a beam, to which the nets are attached, is let down from the trawler, the nets swell

FIG. 18.—Trawling.

out, and when the beam is hauled up, the herrings are pulled up into the boat; the meshes of the net are large enough to allow the small fish to escape. Where the water is too deep for trawling, drift nets are used.

The sailing boats often remain on the fishing grounds for many days, while steamers collect the fish and take the catch to port for distribution.

The herring is sold either fresh, salted or smoked. Many thousands of barrels of salted herrings are sent from Great Britain to the Continent every year.

FIG. 19.—Map of Western Europe, showing the Dogger Bank and 100 fathom line.

Dogger Bank.—The Dogger Bank rises from the bed of the North Sea to within a hundred feet of the surface. In

the sea-weeds which cover the bank myriads of marine creatures live, and provide food for the cod, herring and other fish. Near the southern edge of the bank is a depression called the Silver Pits—this depression abounds in fish.

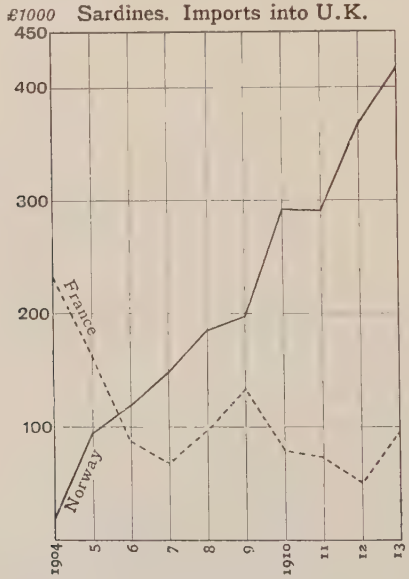

Fig. 20.—The trade of Norway in tinned fish contrasted with that of France.

Haddock, hake, turbot, soles, etc., are caught on the Dogger.

Other fisheries on the British coast are: Mackerel in the English Channel, caught in drift nets; pilchards off the coasts of Devon and Cornwall; whitebait in the Thames estuary; oysters at Whitstable and Colchester.

Sardines, which are immature pilchards preserved in oil, are caught in the Bay of Biscay, but they have decreased in numbers, and the industry is much less important than

formerly. In recent years, the Norwegians have developed a large trade in "sardines"; these so-called sardines are really sprats or brislings.

The Banks of Newfoundland cover an area ten times larger than the Dogger Bank, and the water is deeper, the average depth being 100-600 feet. The Banks stretch from the southern shore of Newfoundland three hundred miles into the Atlantic in a south-easterly direction.

FIG. 21.—The Banks of Newfoundland where the cod fishing is carried on.

Although the Banks of Newfoundland are much farther south than the Dogger Bank the water is much colder, as it is chilled by icebergs which come from Baffin Bay; warm drift currents from the south melt the icebergs, and the melting of the ice gives rise to dense fogs. The cod fishery is therefore carried on under great difficulties, viz. rough water, fogs, low temperature, icebergs, etc.

The cod fishery has been pursued without ceasing for over four centuries, but the cod seems to be as abundant as

ever. In catching and curing the fish over sixty thousand men and women are employed. The fishing begins about June 1st and lasts until the end of October.

St. John's, the capital of Newfoundland, is the chief town connected with the cod fishery ; French fishermen from St. Pierre and Miquelon take part in it, as well as American fishermen from Gloucester and Portland.

On the banks of Nova Scotia and Maine the herring fishery is actively pursued.

Sturgeon.—The sturgeon abounds in the Caspian and lower Volga ; it is also caught in the Great Lakes of North America, especially in Lake Superior, and is occasionally met with on the Dogger Bank. In Russia the fish is used for food ; the roe is prepared and sold as **caviare** ; the bladder as **isinglass.** Astrakhan is the centre of the sturgeon fishing industry in Russia.

Tunny.—The tunny somewhat resembles the mackerel, but is much larger, being ten to twelve feet long. It is found in the Mediterranean, near Sardinia and Sicily, where it is used for food.

Whale.—The whale fishery is less important than formerly ; whale oil is no longer required for lighting purposes, as mineral oils are abundant and cheap. The fishery is, however, still carried on to some extent, as the carcase can be manufactured into fine guano ; the whalebone is also of some commercial value.

Seal.—The **blubber seal** is caught off the shores of Labrador for the sake of the oil in the blubber, but the skin is smooth and of little value. The **fur seal** is hunted for its skin. This seal is most easily caught on the islands in the Bering Sea, especially the Pribilof Group ; the seals resort to these islands for about three months in the breeding season, and while on the islands they can be killed without

difficulty. Canadian fishermen often catch the seals in the water off the coast of British Columbia. It should be noted that whales and seals are not fish but mammals.

EXERCISES.

1. Describe the methods by which cod and herring are respectively caught.

2. Write what you know of the following : Caviare, isinglass, blubber, stock fish, sealskin.

3. State the position of the following :—Bergen, Grimsby, St. John's, and Astrakhan. Write an account of the fisheries connected with these towns.

4. From Fig. 20 find the value of the sardines imported into the United Kingdom from France for each year during the period 1904-13. In the same way find the values for Norway.

5. Describe Figs. 19 and 21 with reference to the fishing grounds.

CHAPTER IV.

COTTON, FLAX, HEMP, JUTE.

1. On an outline map of the world shade the districts noted for the cultivation of (*a*) cotton, (*b*) jute. Mark also the routes by which these articles are brought to Great Britain.

2. Tabulate in parallel columns the chief facts recorded in this lesson with regard to (*a*) American cotton, (*b*) Egyptian cotton, (*c*) Indian cotton.

Cotton.—In early times the use of cotton was known to the inhabitants of many countries of Asia and Africa ; when the Spaniards entered Mexico they found that cotton grew there and was used by the natives as material for clothing. Down to the end of the eighteenth century Europe depended on the Levant and on the East and West Indies for its supply of raw cotton. During the nineteenth century, however, the United States surpassed all other countries in the cultivation of cotton.

Cultivation of Cotton.—The cotton plant is very sensitive to frost ; it grows best in tropical and sub-tropical climates, especially in those areas which have copious summer rains, such as the south-east of the United States and in parts of China. The plant has a long root, and it can adapt itself to a fairly dry climate, although the quality of the fibre suffers in consequence.

The seeds of the plant are embedded in tufts of woolly fibre, to which the name cotton is applied, and it is for this

fibre that the plant is so carefully cultivated. **Cotton seed oil** is obtained by pressing the seeds, and it is often used as a substitute for olive oil; the crushed seed is turned into oil cake as food for cattle, or it is prepared as a fertiliser for the fields. The cotton stalks are converted into pulp, from which fine writing paper is made.

FIG. 22.—Flowers of cotton plant. In the bottom right hand corner is the woolly cotton from a pod which still adheres to the plant.

The three chief areas of cotton cultivation are the United States of America, Egypt and India; cotton is also grown in Brazil, Peru, China, Nigeria and Queensland.

United States Cotton.—The best known kinds of cotton are:—

(*a*) **Sea Island cotton**, grown on the coast belt of Georgia and South Carolina, and on the islands off the coasts

of these states; this cotton is very strong and fine, and it is noted for its long staple (2-2½ inches):

(*b*) **Upland cotton**, grown on the low hills which extend westward to the Mississippi valley.

Cotton also grows well in the alluvial soils of the lower Mississippi valley, where inundations frequently take place. In the United States it is found to be more profitable to sow new seeds every year; during the winter the soil is prepared with artificial manures, and the sowing takes place in March or April. In Texas, the cotton picking usually begins in the month of August; further north, the time of picking gets later, but by the end of the year the whole crop has been gathered.

After the cotton has been picked the seeds are separated from the wool or fibre by means of a machine called a saw-gin. From one hundred pounds of picked cotton about thirty-four pounds of fibre and sixty-six pounds of seed are obtained. The fibre is the raw cotton of commerce, and it is pressed tightly into bales, each weighing about 450-500 pounds. From September to January bales of cotton are being shipped at American ports; the chief of these ports are Galveston, New Orleans, Savannah, Norfolk, Wilmington, Mobile, Charleston.

Although slavery was abolished in the United States in 1865, negro labour is still employed in the cotton fields, and also in the preparation of the cotton for export.

Egyptian Cotton.—In Egypt the area of cultivation is confined almost entirely to the alluvial soils of the Nile delta; these soils are very fertile, and usually produce two crops in the course of a year, cotton being grown as a summer crop and wheat or beans as a winter crop. The rainfall in Egypt is very slight, hence agriculture can only be carried on where the land is watered by the annual overflow of the Nile, or where artificial irrigation is possible. All crops, therefore, have to be carefully tended, and in the case

of cotton this results in a heavy yield of over 300 lbs. per acre compared with about 200 lbs. per acre in the United States. The total production, however, is about one-tenth that of the United States. More than half the raw cotton produced in Egypt is sent to South Lancashire through Alexandria and Port Said. The export months are November to February.

Indian Cotton.—Cotton has been grown in India from very early times; the shortage of American cotton during the Civil War in the United States (1861-5) brought about a great demand for Indian cotton. At the present time, about twenty million acres are under cultivation, chiefly on the Deccan. This district is very suitable for cotton growing because the south-west monsoon, which breaks in the month of May, brings abundant rain, and the black soil of the Deccan retains the moisture during the period of growth. In Bombay, Berar and the Central Provinces, the seeds are sown in June or July; but in Madras the sowing is in August or September. The time of picking lasts from November to February. The fields are not so carefully prepared as they are in the United States and in Egypt; little manure is used and other crops are often grown in the same field, hence the yield rarely exceeds one hundred pounds per acre. Indian cotton has a short staple, and special machinery is required to deal with it. Half the raw cotton produced is used in India, the other half being exported chiefly to Great Britain and Japan. Eighty per cent. of the exported cotton passes through Bombay. Cotton factories in **Bombay** and **Ahmedabad** now give employment to a large number of native operatives.

The Cotton Supply.—Fifty years ago nearly all the cotton grown in the United States was exported to Europe; now, every year more and more raw cotton is being used in the mills of the New England States, especially at Fall River, Lowell, and other centres of manufacture. Of the

raw cotton imported into this country about 75 per cent. still comes from the United States. In order to be less dependent on the United States, Great Britain is seeking other sources of supply.

Cotton growing in the West Indies is being revived. Cotton is being cultivated with success in Nigeria, British East Africa, Nyassaland, Rhodesia. Attempts are also being made to grow it in Queensland.

Flax.—The flax[1] plant is grown in both tropical and temperate climates. From the flax plant two valuable articles are obtained (1) oil from the seeds, (2) fibre from the stalks.

Fig. 23.—Branches of a flax plant.

Oil.—On the Deccan and in the Central Province of India the best seed for oil is produced, but the fibre is nearly valueless. The plant is also grown for the sake of the seed on the Black Soil district of Russia and in the Southern States of America. Flax seed (or linseed) oil is largely used in mixing paints and in the manufacture of oil-cloth and printers' ink. After the oil has been pressed out, the crushed seed provides food for cattle. Linseed meal is used for poultices.

Fibre.—In the Baltic provinces of Russia the flax plant is grown extensively for the sake of the fibre, the seed being of little value; it is also grown for fibre in Caucasia, Austria, Italy, Poland, Germany, Belgium, Ulster, etc. The crop is raised by sowing fresh seeds every year, and in order to produce good fibre the plant must be carefully tended during its period of growth. When the plant has fully developed, several operations are necessary to prepare the flax for the mills.

[1] The Latin name for flax is *linum*; hence note the words:—linen, lint, linseed, linoleum, etc.

(*a*) *Pulling and rippling.*—The flax is pulled up by the roots, and it is then rippled, that is, the seeds are removed by an iron comb. In Belgium the crop is often made into sheaves and stacked for a time before any further process is carried out.

(*b*) *Retting or rotting.*—The stalks, with roots downwards, are soaked in pure, soft water; iron in the water would discolour the fibre and lime would harden it. This operation

Fig. 24.—Rippling flax stalks.

is extensively carried on at Courtrai in Belgium, as the water of the River Lys is singularly free from lime salts. At the end of ten to fourteen days the stalks are taken out and dried.

(*c*) *Rolling and scutching.*—The stems are broken open by rolling, and the woody core is separated from the fibre by scutching.

The fibres, which vary in length from 8-50 inches, are now hatchelled or teased, and in this way are prepared for the mills as linen yarn; from this yarn all kinds of linen goods are made. The chief centres of manufacture are Belfast in Ireland; Dundee and Dunfermline in Scotland; Courtrai

and Ghent in Belgium; Lille and Cambrai in France; Bielefeld and Görlitz in Germany, etc.

Very short fibres are spun into twine and cord. Linen rags are used for papermaking.

Photo Underwood & Underwood.

FIG. 25.—Hatchelling flax; the first process in making linen.

Hemp.—Hemp is produced under conditions very similar to those for flax as regards soil, climate, mode of cultivation and preparation. The fibre resembles flax fibre in many respects, but it is coarser, stronger and more brittle. Hemp is grown for three products: (*a*) the fibre of its stem, (*b*) its oily seeds, (*c*) a resinous secretion in its leaves. The **fibre** is used for making ropes, cordage, sailcloth, sacking, etc.; hemp yarn is often mixed with other yarns in weaving fabrics. The **oil** from the seeds is used in making soap, paints and varnishes. The **resin** is used in making paper, lacquers and varnishes. The finest hemp fibre is obtained

from plants which grow round Bologna in northern Italy; the strongest fibre comes from the Baltic provinces of Russia. Hemp is also grown in France, England, United States and India.

China grass produces a fibre which is often used as a substitute for hemp.

Manilla hemp grows only in the Philippines, and is derived from a species of banana. The fibre, often six to nine feet in length, is obtained from the long leaves of the plant, and it is separated from the leaf by hand labour. The fibre provides the strongest and cheapest material for cordage and sails.

Henequen or **sisal hemp** is obtained from the thick fleshy leaves of a plant which grows in Yucatan (Central America). It is the chief rival of jute as a material for bags for packing goods, and it is largely used for this purpose in the United States.

New Zealand flax is more like hemp than flax. The leaves of the plant are long and narrow, and from them fibre can be cut three times a year without injuring the plant.

Jute.—Jute is obtained from a plant six to twelve feet high, which thrives well on the alluvial soils of the Ganges delta. The plant requires a hot, moist climate, but when the plant is well established it can stand heavy flooding without injury. As in the case of flax, the seed is sown broad-cast; the time of sowing extends from the middle of March to the middle of June. When the flowers appear, the stalks are pulled up, for then the fibre is at its best. The stalks are often taken direct from the fields to the pools or streams for retting, but in some districts they are first dried.

After the fibre has been separated from the stalk it is sorted according to quality; then it is put into a hydraulic press and made into bales, each weighing about four hundred

pounds. Jute fibre is inferior to hemp and flax both in strength and tenacity. The yarn is woven into **gunny cloth**, and this is used for making sacks in which cotton, coffee, rice, etc., can be packed.

Jute is also mixed with other yarns to make carpets, furniture coverings, curtains and plushes; it is now largely

FIG. 26.—Jute plant.

used for this purpose, as jute yarn can be dyed in both bright and delicate shades of colour.

In Bengal seven or eight million bales are produced annually. About half this quantity is used in India, the largest factories being near Calcutta; the rest is exported, and of this Scotland takes more than any other country.

The importation of jute to Dundee began about 1835, but during the Crimean War (1854-56) the demand for jute increased owing to the shortage of flax and hemp from Russia.

Germany, France and Austria-Hungary now import jute in considerable quantities.

EXERCISES.

1. From what raw materials are the following articles manufactured :—Calico, linen, rope? In each case briefly describe the process of manufacture.

2. Why is the manufacture of cotton goods localised in South Lancashire? From what countries is the raw cotton obtained, and what are the chief centres of manufacture?

3. What advantages does Ulster possess for the linen industry?

4. What use is made of the following :—Cotton seed, linseed, hempseed?

5. Describe the plants shown in Figs. 22, 23 and 26.

6. Give the position of Dundee, Manchester and Bombay respectively. Write an account of the textile industry at each place.

7. The quantities of raw cotton imported into the United Kingdom from the United States, Egypt and India respectively during the period 1904-12 are given below.

IMPORTATION OF RAW COTTON.

	Total Import into U.K.	Import from U.S.A.	Import from Egypt.	Import from India.
	Mill. lbs.	Mill. lbs.	Mill. lbs.	Mill. lbs.
1904	1955	1491	325	95
1905	2204	1734	362	49
1906	2007	1488	363	71
1907	2387	1756	423	106
1908	2061	1589	350	70
1909	2189	1640	411	76
1910	1973	1470	329	108
1911	2207	1682	364	79
1912	2806	2165	491	57

From the above quantities make a percentage table for the United States, Egypt and India respectively, and represent the results by means of graphs (see diagrams, page 105).

CHAPTER V.

WOOL AND SILK.

1. Write in tabular form the chief districts in the British Empire for (*a*) the production of raw wool, (*b*) the manufacture of woollen goods.

2. On a map of Europe mark the most important towns and districts connected with (*a*) the wool trade, (*b*) the production of silk goods.

Wool.—Wool provides the chief material for clothing in nearly all countries of the temperate regions. Wool is a bad conductor of heat, and it does not readily absorb moisture; it is distinguished from hair by the fineness, softness and serrated surface of its fibres. The serrated or saw-like edges cause the fibres to mat together, a property known as *felting*, and hence in washing, woollen fabrics tend to shrink and to thicken.

Sheep thrive best in a dry, equable climate, where there are no extremes of heat or cold, hence the chalk ranges (Downs and Chilterns) and limestone hills (Pennines and Cotswolds) are particularly suitable for sheep farming.

The best known breed of sheep is the **merino**; it was first reared in Northern Africa and in Spain. From Spain merino sheep were introduced at different times into England, Saxony, Silesia and Bohemia in order to improve the breeds in those countries. The success which has attended sheep farming in Australia, Cape Colony and the Argentine is due largely to the merino sheep. The merino is essentially a

"wool" sheep, not a "frozen mutton" sheep; for the latter kind a larger carcass is required. The wool of the merino is noted for the length, strength and fineness of its staple.

Europe is still the chief wool-producing continent, though, as most of the wool is manufactured locally, little is heard of European wools. In England, the wools of Leicester and

FIG. 27.—Merino sheep.

Lincoln are noted for their lustre and long staple. Germany, France, Austria-Hungary and Russia all produce wools of fine quality. In Australia, sheep farming is extensively carried on on the Darling Downs and the Bathurst and Liverpool plains and on the uplands of Victoria and Western Australia. Wool, the most valuable export of Australia, is chiefly exported to Great Britain.

In South Africa sheep are kept on the karroos and veldt; the wool is not so fine nor so long in staple as Australian wool.

Argentine wool is mostly sent to France, Belgium, Germany and the United States.

Processes.—Raw wool is first cleansed from the yolk or natural grease; unless this is done thoroughly, the yarn does not dye well. Short staple wools are carded and spun much in the same way as cotton, and the yarns are used in making *milled* or *fulled* cloth. Fabrics made from these yarns are known as woollen goods. After weaving, the cloth is shrunk, and then by means of teasels the nap of the cloth is raised, so that a uniform surface is obtained without the appearance of the intercrossing of the fibres. The principal varieties of woollen goods are—

(*a*) **broadcloth** - which has a great width of web;
(*b*) **cashmeres**—thin, twilled fabrics used for ladies' dresses;
(*c*) **tweeds**—cloth of loose texture used for men's clothing;
(*d*) **blankets**, flannels, etc.

Long staple wools are combed and then spun into yarn called *worsted*. These yarns are used to manufacture merinos, serges, hosiery, and for this purpose they are often mixed with other yarns such as mohair, alpaca and camel's hair.

Carpets belong to the worsted branch of the woollen industry; the best carpets, such as Brussels and Axminster, are made on a ground of strong linen or hemp: only inferior carpets are made of pure wool.

Manufacturing Districts.—In the great manufacturing districts one branch of the industry only is carried on at a particular place, for example, in the West Riding of Yorkshire, Leeds specialises in ready-made clothing, Huddersfield in broadcloth, Bradford in mohair, Halifax in carpets, Dewsbury in flannel, and Batley in shoddy; while Hawick and Galashiels, in the Tweed valley, manufacture tweeds.

Other important centres of manufacture are Roubaix and Tourcoing in France; Verviers in Belgium; Barmen in

Westphalia; Chemnitz in Saxony; and Philadelphia in the United States.

Silk.—For many centuries before the Christian era, silk weaving was practised in China, and it is still one of China's important industries. Silkworms can be reared in all countries in which the mulberry tree grows, as they feed on mulberry leaves. The production of raw silk is, however, confined to Europe and Asia; the climatic conditions of other parts of the world (*e.g.* California, Queensland, etc.) are suitable, but the industry cannot be carried on profitably in any region unless there is plenty of cheap labour; in addition to this the various operations require great care, delicate manipulation, and inherited skill. China and Japan produce most raw silk; it is also produced in Bengal, Piedmont, the Levant and Persia.

In India and Mongolia the cocoons of several wild species yield *tussore* silk.

The Chinese silkworm.—From the time it is hatched until it spins its cocoon the silkworm feeds on mulberry leaves; this period is about forty days. It takes three to five days spinning its cocoon, and when this is done the larva is killed. By immersing the cocoon in hot water the gum that binds the threads together is softened.

Reeling.—The process of reeling, by which the filaments of two or more cocoons are brought together and formed into one continuous, uniform and regular strand, is now carried out; this work is done by hand, and it requires great skill on the part of the operator.

The reeled silk is the raw silk of commerce. It is estimated that a thousand perfect cocoons yield about one pound of raw silk.

Throwing.—After cleansing the raw silk from the gum which still adheres to it, the silk is thrown, a process by which the delicate fibres are twisted and doubled into more substantial threads in order that they may be strong enough

to be worked on the loom. After weaving, several other operations are required, such as dyeing, printing and finishing.

In **China** silkworms are reared chiefly in the middle provinces (lat. 30°-35° N.), and in the province of Kwang tun. More than two-thirds of the raw silk produced in China is exported; Shanghai is the great Chinese silk market, and Nanking is noted for manufactured silk.

Italy produces more raw silk than any other country in Europe—some of it is manufactured at Milan, but more than half of it is exported to France.

France is first among European countries for the manufacture of silk fabrics. Lyons is the chief centre of the industry, but St. Etienne is also important. The rearing of silkworms and the manufacture of silk goods in the Rhone valley first became important in the sixteenth century. A great impetus was given to the industry at the beginning of the nineteenth century by the invention of the Jacquard loom for the weaving of figured patterns. Satins and velvets are specially named silk fabrics.

Other centres of silk manufacture are Crefeld, in Germany; Zurich and Basle, in Switzerland; and Macclesfield, in England. The United States import large quantities of raw silk from China and Japan to be manufactured in the silk mills of the states of New Jersey, New York and Pennsylvania. The largest silk ribbon mill is at Paterson in New Jersey.

EXERCISES.

1. Describe what happens to the wool from the time it is sheared from the sheep's back in Australia until it is turned into an article of clothing in this country.

2. Under what conditions does the silk industry thrive best? Why has England never become important for the manufacture of silk goods?

CHAPTER VI.

FORESTS AND FOREST TREES.

1. On an outline map of the world mark the great forest areas. With different colours distinguish the forests described in this lesson.

2. Draw rough sketches of the following trees: Pine, oak and palm. By the side of each sketch note the characteristics of the tree.

Forests cover large tracts of land in various parts of the world; they influence the humidity of the air and soil, they moderate to some extent the extremes of heat and cold, they afford shelter to man and beast, and they enrich the soil upon which they grow. Trees supply timber and fuel to man, and they furnish him with a great variety of useful and valuable products, such as gums, drugs, dyes, and articles of food.

The great forests of the world may be classified as—

(1) **temperate** forests, in which coniferous and deciduous trees predominate;

(2) **sub-tropical** and **tropical** forests, in which evergreen trees and palms abound.

In temperate regions, **coniferous** or cone-bearing trees are found farther north, and at a higher elevation than any other trees; not only do they grow in cold climates, but they also thrive in poor soils, such as the sandy soils of the Baltic region and the sparse soil of the Scottish Highlands.

The chief coniferous trees are the pine, fir, larch and spruce.

Coniferous forests cover the lower slopes of the Scandinavian mountains, and they form a great belt of forest land across Finland and Russia. On the Highlands of Southern Germany (Black Forest) and on the mountains of Switzerland and Austria-Hungary pine trees flourish. In the Eastern

FIG. 28.—Pine tree.

FIG. 29.—Cones of the fir tree.

provinces of Canada and on the slopes of the Rocky Mountains coniferous trees have given rise to the great **lumbering** industry.

The straight trunks of the pine are useful for masts of ships and for telegraph poles; and the cones are used for fuel. The timber is used for building ships and houses, for making window frames and furniture, etc.; the softer timber is crushed into pulp for paper making; resin is obtained from cuts in

the trees, and turpentine from the pine wood. The bark of the spruce is used in the tanning of leather. In sub tropical lands the pine grows to an enormous size, e.g. the Californian pine and the Kauri pine of New Zealand.

Photo Underwood & Underwood.

FIG. 30.—Collecting turpentine from pine trees.

Deciduous trees are those which lose their leaves in autumn; the oak, elm, birch, beech, chestnut, and maple are examples of deciduous trees. All these trees are noted for timber from which furniture, building materials, etc., can

be made. The oak thrives best on a fairly stiff soil such as clay, while the beech grows well on chalk formations; where these trees grow extensively the acorns and beechnuts provide food for pigs. The bark of the oak is used in the tanyards.

Fig. 31.—Oak tree.

The maple, which grows abundantly in Canada, produces a useful timber, and from the sap of the tree sugar is prepared.

In New South Wales the **eucalyptus** (or gum tree) grows on the slopes of the Blue Mountains, and it is the tree which gives the tint to the landscape. From the leaves of the tree is obtained eucalyptus oil, which has valuable medicinal properties. From Australia the eucalyptus tree has been introduced into Italy and other countries.

From Western Australia comes the hard **jarrah** timber, which is chiefly used for wood paving.

In sub-tropical lands, such as the Mediterranean region and California, the trees are chiefly **evergreens**, *e.g.* myrtle, olive and orange. In these lands most rain falls in the

FIG. 32.—Australian gum tree.

winter, and the temperature, except on the mountains, never reaches freezing point.

Tropical Forests.—The equatorial forest belt includes the forests of the Amazon basin (the Selvas), the Congo basin, the Guinea coast, and the East Indies (Borneo, New

FIG. 33.—Palm trees.

FIG. 34.—Date Palm.

Guinea, etc.). In this belt the rainfall is excessive, and the temperature is always high.

In tropical forests the palm, rubber tree and logwood are the chief trees of commercial value.

Palm trees abound in countless varieties; on the west coast of Africa palm oil is obtained in great quantities, and is used in manufacturing soap, etc. The date palm provides food for the Arabs of Arabia and Northern Africa.

The **rubber tree** grows wild in Brazil, Central Africa, and Borneo, but recently the demand for rubber has been so great that rubber trees have been planted on an extensive scale in many tropical lands. The rubber of commerce is a tough, elastic substance obtained by drying the milky sap of certain tropical trees. When mixed with

FIG. 35.—Rubber trees—Natives collecting the sap.

sulphur, rubber is said to be vulcanised, it is then harder than before, and it can be used for tyres, machine bands, etc.

Mahogany and other hard woods for furniture-making are obtained from British Honduras and from Brazil. Mahogany is not only very hard and durable, but it takes a very high polish.

On the slopes of the Andes in Peru and Ecuador the cinchona tree grows wild: from the bark, known as Peruvian

or Jesuits' bark, the drug quinine is distilled. The cinchona has been transplanted from South America to Ceylon and Northern India, where it protects the tea plants.

FIG. 36.—Cocoa (coker) nut palms. The picked fruit is lying on the ground.

Teak.—On the Western Ghats and in Lower Burmah teak forests flourish. Teak wood is very hard, and it contains a natural oil which prevents iron bolts from rusting; for this

reason teak wood is displacing oak as a backing for the iron plates in ships.

EXERCISES.

1. Distinguish carefully between the following kinds of trees: Coniferous, deciduous, evergreen. Give examples of each kind.

2. What trees are most useful to men for (*a*) timber, (*b*) drugs? State one part of the world in which each tree flourishes, and point out the special use to which it is put.

3. Write what you know of the rubber tree. Why is rubber in such demand?

4. From the list of Imports on pages 136-144 write in tabular form the countries from which the United Kingdom obtains large quantities of wood or timber. Opposite each country write the value of the import, and then represent the values in the form of a diagram.

5. Say what you know of:—Kauri gum, resin, turpentine, quinine.

6. What kinds of wood are used chiefly
   (*a*) in making furniture?
   (*b*) in constructing houses?
   (*c*) in building ships?

In each case state why the particular kind of wood is used.

CHAPTER VII.

COAL, GOLD, SILVER, IRON.

1. From the subjoined table find the world production of coal. Make a percentage table for the various countries, and then draw a diagram.

On a map of Germany find the coalfields in the subjoined table, and on a map of the United States find the Appalachian coalfield.

COAL PRODUCTION.

United States.		Great Britain.	
Coalfield.	1,000 tons.	Coalfield.	1000 tons.
Appalachian,	311,036	Northumbd. & Durham,	54,737
Central States,	58,150	York, Derby, & Not'h'm,	66,164
Western States,	14,854	Lancashire,	23,600
Other Districts,	35,960	Staffordshire,	13,860
		Wales (and Monmouth)	52,800
		Scotland,	40,940
		Other Districts,	14,151
Total,	420,000	Total,	266,252

Germany.			
Coalfield.	1,000 tons.	Coalfield.	1,000 tons.
Westphalia,	76,258	Saxony,	5,175
Silesia,	36,184	Other Districts,	4,546
Bonn,	15,372	Total,	137,535

Coal is also raised in the following countries:—France, 35 million tons, Belgium 24, Spain 4, Russia 22, Australia 9, New Zealand 2, British South Africa 4, Canada 9, India 10, Japan 13, Other Countries, 50.

EXPORTATION OF COAL.

Port.	1,000 tons.	Port.	1,000 tons.
Cardiff, - - -	17,346	Hull, - - - -	3,482
Newport, - - -	4,120	Grimsby, - - -	1,578
Swansea, - - -	3,517	Glasgow, - - -	1,995
Port Talbot, - - -	1,599	Methil, - - -	3,517
Tyne Ports, - - -	12,219	Burntisland, - -	1,683
Blyth, - - - -	3,678	Grangemouth, - -	1,691
Sunderland, - - -	2,967	Leith, - - -	1,426

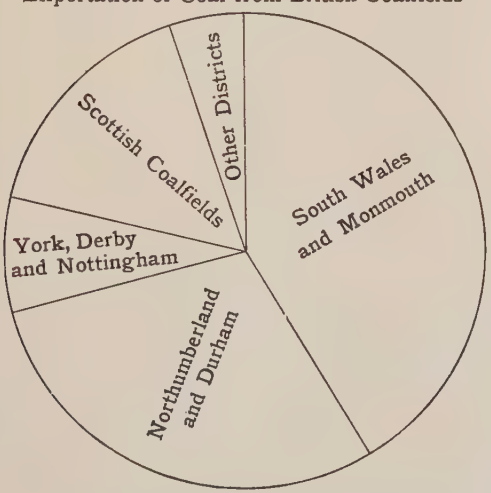

FIG. 37.—The diagram is drawn from the quantities given for the various seaports in the above table.

2. (*a*) On an outline map of Great Britain mark the seaports for coal export, and shade the coalfields near these seaports.

(*b*) From the foregoing table find the quantity of coal exported from Great Britain. What percentage of the whole is exported from Cardiff and the Tyne ports respectively.

3. Find the total value of (*a*) gold, (*b*) silver imported into the United Kingdom. What percentage of the imported gold came from South Africa? What percentage of silver from the United States of America?

IMPORTATION OF GOLD AND SILVER INTO U.K.

Gold Bullion and Specie.		Silver Bullion and Specie.	
Country from which Imported.	Value. £1000.	Country from which imported.	Value. £1,000.
United States of America,	2,442	United States of America	11,675
France,	2,680	France,	270
Germany,	1,417	Germany,	336
Brazil,	975	Brazil,	27
Netherlands,	617	Netherlands,	57
Total from Foreign Countries,	10,121	Total from Foreign Countries,	12,704
Gold Coast,	1,032	Gold Coast,	22
Union of South Africa,	36,360	Union of South Africa,	58
British India,	2,709	Ceylon & Dependencies,	351
Australia,	1,860	Australia,	50
New Zealand,	638	New Zealand,	35
British West India Is.,	291	British West India Is.,	57
Total from British Possessions	43,228	Canada,	911
		Total from British Possessions,	1,537

4. Draw a graph to represent the value of the diamonds imported from the Union of South Africa during the period 1905-12.

IMPORTATION OF DIAMONDS FROM THE UNION OF SOUTH AFRICA.

Year.	Value in £1,000	Year.	Value in £1,000
1905	6,759	1909	6,170
1906	9,179	1910	8,290
1907	8,829	1911	8,267
1908	4,607	1912	9,090

Coal.—Coal has been formed from vegetation which flourished in long past ages, and it is now usually found in strata overlaid by younger rocks. The three commonest kinds of coal are *lignite*, *bituminous* and *anthracite*; these differ chiefly in the percentage of carbon which they contain, anthracite having the greatest percentage, viz. 85-95.

Lignite or brown coal is found in large quantities in North America and in Russia; it is, however, inferior to true coal.

Bituminous coal readily bursts into flame when kindled, and is therefore used largely for household purposes; **cannel** or *candle coal* is a kind of bituminous coal, and is specially useful is making gas.

Anthracite burns with little flame and with no smoke, but it produces intense heat; the anthracite of the mid-South Wales coalfield is known as *steam coal*, and is in great demand for warships. Anthracite is also used for drying hops and malt and in blast furnaces.

In this country coal was used for domestic purposes as early as the ninth century, but it was not until the fourteenth century that coal, brought from the Tyne, was sold in London.

For many centuries after this the consumption of coal was small, for it could only be used in the few places where it was mined, or in the towns on the coast to which it could be easily shipped.

The use of coal as fuel for smelting iron ore, the application of steam power to machinery, and the development of railways

by which it was distributed without difficulty, all tended to increase the importance of the coal mining industry. Coal attracts industries to the district where it is mined, for it is more economical to manufacture goods on a coalfield, and so save the cost of carriage for fuel.

From the table (pp. 64-5) it will be seen that the greatest coal-producing countries are the United States, Great Britain and Germany; it should also be noted that these are the leading manufacturing countries of the world.

United States.—Two-thirds of the coal produced in the United States is obtained from the **Appalachian coalfield**, which stretches from the State of New York to the State of Alabama; most of the coal is bituminous, but anthracite is mined in Pennsylvania. At Connelsville enormous quantities of bituminous coal are turned into coke for use in the furnaces at **Pittsburg**. Iron ore is brought from the districts near Lake Superior to be smelted and manufactured on this coalfield. The textile factories of the New England States are supplied with fuel and with machinery from the Pittsburg district. At Birmingham (Alabama) coal and iron are found together.

Coal is also mined in other parts of North America, such as Illinois, Cape Breton Island, Vancouver Island.

Great Britain is noted (*a*) for the localisation of certain industries on particular coalfields and (*b*) for the exportation of coal. The chief coalfields with their important industries are:—

(1) **South Wales**; the smelting of iron and copper ore, the making of tin plate goods, the exportation of steam coal from Cardiff and Swansea.

(2) **South Staffordshire** (the Black Country): machinery and hardware in the towns round Birmingham.

(3) **North Staffordshire** (the Potteries): the making of earthenware.

(4) **South Lancashire**; cotton goods in the towns round Manchester.

(5) **York**, **Derby** and **Nottingham**; woollen goods (chief centre Leeds), cutlery (Sheffield).

(6) **Northumberland** and **Durham**; shipbuilding on the Tyne and Wear; machinery and guns (Newcastle); exportation of coal.

(7) **Lanarkshire**; shipbuilding on the Clyde; textiles and iron goods (Glasgow); exportation of coal.

(8) **Ayrshire**; machinery (Kilmarnock). Fifeshire; linen goods (Dunfermline).

Germany. The chief coalfields are:—

(1) **Westphalia** (R. Ruhr); machinery and guns at Essen; textiles at Barmen, Elberfeld, etc.

(2) **Saxony**; iron goods and hosiery at Chemnitz.

(3) **Silesia**; coal mining—the south-west of Silesia, linen at Gorlitz.

Other important coalfields in Europe are:

(1) North-east France; lace (Valenciennes), woollen goods (Roubaix).

(2) Belgium; iron and steel goods (Liège); linen (Courtrai).

(3) Donetz valley in S.W. Russia.

Petroleum (rock oil) is obtained from wells in large quantities at Baku on the Caspian, in Pennsylvania, Galicia, Rumania, Mexico and Peru. It is purified and is used as fuel in motors, locomotives and in warships.

Gold.—Gold is widely distributed over the earth's surface, and it is eagerly sought for in all parts of the world. At the present time the greatest supply comes from Witwatersrand near **Johannesburg** in the Transvaal. It is also found in the hot desert lands of Western Australia, the frozen districts of

the Yukon (Klondyke), as well as in California, Eastern Australia, Hungary, etc.

The two chief methods by which gold is obtained are: (1) placer or alluvial mining; and (2) quartz or vein mining. In the course of centuries gold-bearing rocks have been broken up by frost, rain and other agencies; consequently

FIG. 38.—Finding gold by washing.

particles of gold have been carried down and deposited in the gravels of the river beds. In some cases the gravel containing gold has been buried beneath later deposits of other materials; as the gold is very heavy it can be separated from the gravel by "washing" out the lighter substances.

Quartz mining.—The vein of rock containing gold is blasted with dynamite, and the quartz thus separated is taken to a mill, where it is crushed by machinery and then treated with mercury. By improved methods, practically all the gold is now extracted from the quartz. The preparation

of the pure gold is usually carried on in the mining district, after which the gold is sent away in the form of bars. Nearly all the gold from Johannesburg and Australia is sent to London, where it is either minted or used in the manufacture of ornamental articles.

The discovery of gold attracts a large population to the district, and in a new country this is an advantage; it is probable that, without gold, Australia would be occupied by a few sheep farmers at the present time, and California by fruit growers.

Gold mining cannot be looked upon as a permanent industry; the mines must be worked out in time, and when this happens the miners must either leave the district to work elsewhere or they must remain and adopt some other method of gaining a livelihood. Ballarat, in Victoria, is an example of this; the town grew up as the centre of a rich gold mining district, but gold mining is a thing of the past, and agriculture is now being carried on in the surrounding districts.

Silver is found in many countries, but the largest output comes from Mexico, United States (especially Nevada) and Bolivia. A large part of the silver supply of the world is obtained from ore containing lead as well as silver, or copper and silver.

Iron ores are widely distributed, but they are only mined where they are comparatively rich, so that the yield of pure metal pays the cost of extraction. In some places where iron ores exist there are no facilities for smelting or for transport; hence really important iron-mining regions are not very numerous.

The United States, Germany, Great Britain, Spain and Sweden are the great iron-producing countries.

Iron ore is placed in a smelting furnace with coal, charcoal, coke, or some other fuel, together with limestone as a flux. The molten iron is run off, and is called *pig-iron*

or *cast-iron*. The pig-iron is turned to *wrought-iron* by puddling, and it then undergoes a series of processes (the Bessemer or other improved process) to turn it into *steel*, which is flexible, elastic and very hard.

Lead is used for making small gas pipes; also for making shots of all kinds. The chief sources of production are Spain, United States and Germany. Great Britain imports large quantities of lead.

Copper is in great demand because it is a good conductor of electricity; it is also used with tin for making bronze, and with zinc for making brass. It is mined near Lake Superior, in Spain (Rio Tinto) and in Australia (Burra Burra).

Tin is chiefly obtained from the Malay Peninsula and New South Wales. The mines of Cornwall now yield very little tin. The chief use of tin is for covering sheets of iron with a thin layer of tin.

Platinum is valuable because of its resistance to heat and acids. The supply comes almost entirely from the Urals.

Diamonds are obtained at Kimberley and Jagersfontein in South Africa; they are also found in Brazil.

EXERCISES.

1. Describe the process of (*a*) coal mining, (*b*) gold mining, respectively. To what uses are coal and gold respectively put?

2. Why is the production of iron of great benefit to the locality in which it is mined? And why is gold of little permanent benefit?

3. What articles are used for fuel? Describe the relative importance of these articles.

4. Give the position and importance of Pittsburg, Johannesburg, Broken Hill, Kimberley, Rio Tinto and Baku.

CHAPTER VIII.

THE GREAT RAILWAY ROUTES.

1. On an outline map of Asia draw the Trans-Siberian Railway and mark the chief towns. Also mark the productions of the various districts along the railway.

FIG. 39.—A network of railway lines.

2. Measure the length of the Canadian Pacific Railway from Montreal to Vancouver, and find the highest point on the railway. Do the same for the railway from New York to San Francisco.

Railways.—Railways now cross the Continent of Europe in all directions, and they afford a rapid means of transit. Rivers and canals in Northern Europe are covered with ice in the winter, and consequently traffic is hampered; the railways are open all the year round. The railways also provide direct routes from north to south, crossing the mountain passes at high elevations or tunnelling the ridges.

The great railway routes which cross Europe are:—

(*a*) Flushing, the Hook, or Hamburg to Berlin and thence *via* Warsaw to Moscow, the starting-place of the Trans-Siberian Railway.

(*b*) The Hook, Antwerp, or Ostend to Cologne then *via* Frankfort-on-Main to Vienna; thence through Budapest, Belgrade, Sofia, Adrianople to Constantinople.

(*c*) Vienna to Trieste; Budapest to Fiume; Munich to Italy *via* Brenner Pass.

(*d*) Basle to Milan by the St. Gothard Tunnel, Lausanne to Milan by the Simplon Tunnel, Mâcon to Turin by the Cenis Tunnel. By these routes Brindisi or Genoa can be reached.

(*e*) Paris to Marseilles *via* Dijon and Lyons.

The Trans-Siberian Railway.—This railway runs from Moscow to Vladivostok, a distance of about 4500 miles. In 1861 the town of **Vladivostok** was founded as a Russian outpost on the Pacific Coast, and in 1890 the Russian Government decided to construct a railway for military purposes across Siberia to this important outpost.

On leaving Moscow the railway first crosses the flat agricultural lands of Russia, bridging the Volga at Samara, and then passes across the Urals by easy gradients. In the Urals section is Zlatoust, an important mining centre. From the Urals to Irkutsk the railway runs through the plain of Southern Siberia; in this section, the scenery is very monotonous, many rivers have to be crossed and the lands lying

near the railway are being rapidly developed for wheat cultivation.

From **Irkutsk** the route passes round the southern shore of Lake Baikal, and enters a mountainous country where mining for gold, silver, and lead is the chief industry. This was the most difficult section to construct, and it was not completed until 1906. Leaving the Amur the railway enters Manchuria, a land which produces cereals, cattle, sheep, and

FIG. 40.—The Trans-Siberian Railway.

minerals; and at Kharbin one branch runs direct to Vladivostok and a second turns southwards to **Port Arthur**. The latter section has been held by the Japanese since the Russo-Japanese war.

The Trans-Siberian railway is chiefly important because

(1) it is developing the lands along its route, especially in the wheat-growing area; and

(2) it provides a quick route to China and Japan; by this route, a letter posted in Shanghai would reach London in about seventeen days, but by the Suez Canal route it would take about thirty-five days.

Africa.—The most important railways in Africa are in lands under British control, such as British South Africa, British East Africa and the Nile valley.

Cape to Cairo Railway (Southern Section).—The Cape Government first constructed a railway from Cape Town across the Great Karroo and the Orange River to the diamond fields at Kimberley.

Mr. Cecil Rhodes urged the extension of this railway north of Kimberley, and he also suggested that Cape Town and Cairo might eventually be connected by rail. In 1898 the railway from Kimberley to Mafeking was opened, and in the following years it was continued across the veldt to Buluwayo. From Buluwayo it was decided to extend the railway to the coalfield at Wankie, and then to the **Victoria Falls.** A bridge, 400 feet above the river, spans the gorge of the Zambesi. The advantage of crossing the Zambesi at this place is that the Victoria Falls can be used for generating electricity. North of the Zambesi the railway reaches its most northerly point at Katanga, a mining centre in the Belgian Congo State.

Cape to Cairo Railway (Northern Section).—Railways were first constructed in Egypt to connect Cairo with Alexandria and Ismailia. The extension from Cairo southwards to Wady Halfa was undertaken for military purposes; the section across the desert to Abu Hammed and Berber was constructed in order to carry soldiers and military stores for the re-conquest of the Egyptian Soudan. After the battle of Omdurman in 1898 **Khartum** once again became a centre of trade, and the railway was completed from Berber to Khartum, with a further extension to the mines at Sennar.

The railway from Khartum to Cairo is now of commercial importance, as the products of the surrounding districts, cotton, gums, skins, feathers, and many others are carried to Khartum, and thence sent down to Cairo or Alexandria.

North America.—The **Canadian Pacific Railway** runs from Montreal to Vancouver *via* Ottawa, Port Arthur, Winnipeg, Calgary, Kicking Horse Pass (Rocky Mountains). This railway was opened for traffic in 1885. It provides through communication between the Atlantic and Pacific Coasts, and forms part of a direct route from Great Britain to Japan. Fast steamers cross the Pacific from Victoria (Vancouver Island) to Yokohama.

The C.P.R. has helped greatly in the settlement of Manitoba, Saskatchewan and Alberta. The lands near the railway have been developed by immigrants from Europe; the produce of the land—wheat, hides, meat, etc.—can be sent away by rail; and machinery, articles of clothing, and other manufactured goods can be brought to the farmers.

Lands which lie north of the C.P.R. are now being occupied by settlers, and through these lands the **Grand Trunk Railway** has been constructed from Winnipeg to Edmonton. This railway will eventually be extended across the Rocky Mountains to Port Rupert, on the Pacific Coast.

In winter, when the St. Lawrence is frozen, passengers and goods for the west are landed at Halifax or at St. John, and are sent by rail to Montreal. The direct line from St. John to Montreal passes for some distance out of Canadian territory and crosses the state of Maine.

In the densely populated areas of the United States between the Atlantic and the Mississippi there is a network of railways connecting all the important centres of population. In 1869 the first trans-Continental railway, the **Union and Central Pacific**, was completed from New York to San Francisco *via* Pittsburg, Chicago, Omaha and Salt Lake City.

The **Southern Pacific Railway** connects New Orleans to San Francisco *via* Houston and Los Angeles.

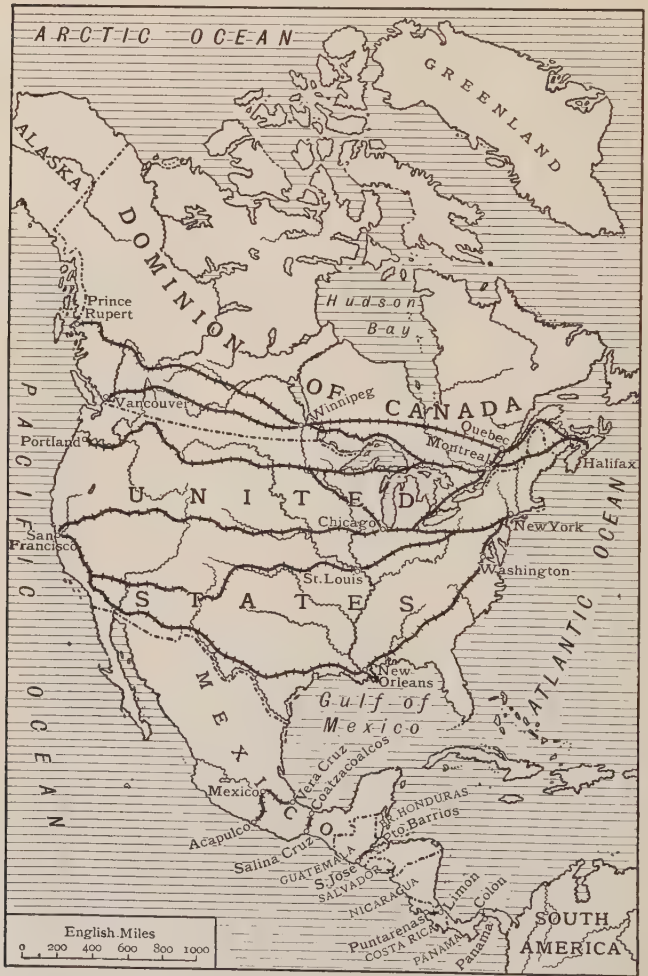

FIG. 41.—The Trans-Continental railways of North America

The **Northern Pacific Railway** runs from Duluth to Seattle *via* Bismarck and Helena.

In **South America** the only trans-continental railway runs from Buenos Aires to Santiago. It crosses the Andes by the Upsallata Pass.

EXERCISES.

1. The distance from Cape Town to Southampton is about 6000 miles ; from San Francisco (*via* New York) to Southampton about 6400 miles. How is it that a man starting from San Francisco will probably reach Southampton before a man who left Cape Town at the same time.

2. Compare the districts passed through on the following railway routes :—

(*a*) Cairo to Khartum.
(*b*) Cape Town to the Victoria Falls.

3. Describe the following overland routes :—(*a*) London to Marseilles, (*b*) London to Brindisi. Why do many travellers to the east prefer the route *via* Marseilles to the route *via* Brindisi ?

4. Examine the trans-continental railways of North America from Fig. 41. Write short notes with regard to each railway route. Point out the importance of the ports where the railways terminate.

5. In what ways does the construction of a railway through a district assist in developing the resources of the district ? Give examples.

CHAPTER IX.

OCEAN TRADE ROUTES.

1. On an outline map of the world mark a route by which a ship could sail round the world. On the same map draw the sailing ship route from England to India, using the facts given on p. 81.

2. Measure the distance a ship would travel from Hong Kong to New York—

(*a*) *via* the Suez Canal;
(*b*) *via* South Africa;
(*c*) *via* the Panama Canal.

Ocean Trade Routes.—All the great ocean trade routes of the world were discovered by navigators in sailing ships, and a great deal of the world's commerce is still carried on by sailing ships; the advent of steamships belongs to the nineteenth century. Sailing ships depend on wind power, and hence a direct route between two ports is in some cases impossible, because the prevailing winds are contrary, and so a longer route has to be traversed in order to obtain fair winds. A knowledge of the wind belts was of the greatest importance to navigators, and this knowledge was only gained by actual experience.

Many centuries ago the Arabs discovered that at a certain time of the year they could sail across the Arabian Sea to India with the help of the south-west monsoon, and, if they waited till the monsoon changed, they could return with a favourable wind.

On his voyage of discovery to the west, Columbus first sailed south to the Canary Islands, and then, being helped by the N.E. trade winds which prevail between 0° and 30° N., he succeeded in reaching the Bahamas.

The earliest voyages round the world (Magellan, Drake, etc.) were all made from the Atlantic Ocean round South America into the Pacific in the teeth of the westerly winds, and the return journey was made round South Africa against the same winds. It was not until the end of the eighteenth century that the wind belts of the world became sufficiently understood for navigators to circumnavigate the world in the opposite direction.

Sailing Route to India.—A ship sailing from London to India first tacks against the south-west wind across the Bay of Biscay and along the coast of Morocco to the Canary Islands; thence the north-east trade winds carry her towards the coast of South America, and she keeps along that coast to avoid the south-east trade winds. After crossing the parallel of latitude 30° S. she soon reaches the region where the westerly winds blow. Passing near Tristan d'Acunha, she is carried eastwards into the Southern Indian Ocean until she approaches the islands of St. Paul and New Amsterdam. Then turning northwards, the south-east trade wind helps the ship on her way to India. By this route the sailing ship has travelled a distance of about 18,000 miles instead of about 10,000 (the direct distance *via* South Africa), but she has saved many weeks in time.

Ships driven by **steam power** are to a large extent independent of the wind, and so they can take a direct course from one port to another. Steamers are therefore more trustworthy in maintaining a regular service between ports, both for passengers and mails.

Steamers provide a means of quick transit, and to merchants and traders this means a saving not only of time but of money.

Ocean liners of the present day have enormous carrying capacity, and this often means economy in working the ship.

The North Atlantic.—The largest and fastest steamers in the world traverse the North Atlantic between New York and European ports. This part of the ocean is also much more crowded with shipping than any other ocean.

The North Atlantic separates the United States and Canada on the West from Great Britain, Germany, France

Fig. 42.—Atlantic liners.

and Belgium on the east. These countries are noted for their productiveness, natural resources, industrial areas and commercial activity. Food products, raw materials for manufactures, and manufactured articles are sent from American ports to Europe, while textiles, machinery, as well as emigrants, are carried from Europe westwards.

The passenger traffic across the North Atlantic is enormous; and to cater for this traffic liners are fitted up with every luxury. The distance from Liverpool to New York is about three thousand nautical miles, and the voyage can be accomplished in less than five days.

The North Atlantic is also traversed by steamers from European ports to the West Indies and South America, and by those going across the Bay of Biscay to reach the Mediterranean and the west coast of Africa.

The Indian Ocean.—The chief routes across the Indian Ocean are those taken by ships which have come through

FIG. 43.—Coolies coaling a steamer.

the Suez Canal to reach Bombay, or which, after calling at Colombo, proceed to Calcutta, China, Japan or Australia.

From South Africa, steamers cross the southern Indian Ocean to Australian and New Zealand ports.

Pacific Ocean.—The chief routes are from Victoria to Yokohama; from San Francisco to Hawaii and Yokohama; from Victoria or San Francisco to New Zealand; and from New Zealand across the southern Pacific to Europe, *via* Cape Horn.

Ship Canals greatly reduce the sailing distances between ports.

Suez Canal.—A ship from Southampton to Bombay *via* the Strait of Gibraltar and the Suez Canal travels about 6000 nautical miles. Before the opening of the Suez Canal, the ship had to sail round South Africa. The distance from Southampton to Cape Town is also 6000 nautical miles, and from Cape Town to Bombay is about 5000 miles. By using the Suez Canal, the ship therefore saves a journey of 5000 miles. A passenger for Bombay can save still more by travelling by one of the overland routes *via* Marseilles or Brindisi.

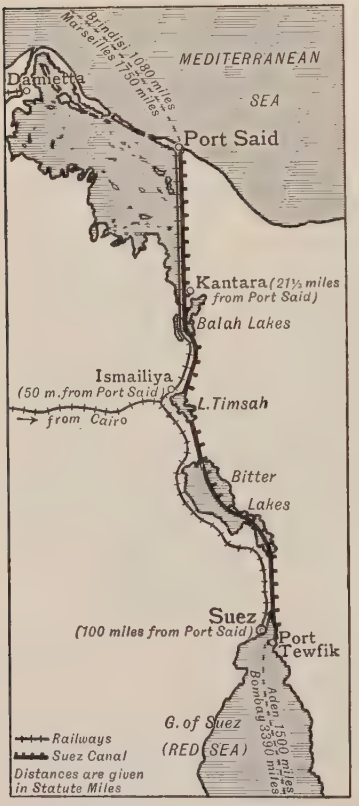

FIG. 44.—The Suez Canal.

Panama Canal.—After the conquest of Peru by the Spaniards in the fifteenth century, silver, gold and other products of Peru were brought by sea to Panama, carried on mules across the isthmus to Colon, and thence shipped to Cadiz.

With the decay of Spanish power this traffic gradually declined. The importance of the *gold road* across Panama revived, however, with the discovery of gold in California

about 1840. The absence of railways across the United States, and the dangers of sending gold by a land route, resulted in the Panama route being used from California to the Eastern States, and in 1855 a railway was constructed

FIG. 45.—The Panama Canal.

from Panama to Colon. With the opening of trans-continental railways, the Panama route once more declined.

The attempt of de Lesseps, the engineer of the Suez Canal, to cut a canal across Panama failed; and it was not until the Spanish-American War (1898) that the United States Government realised the danger of having to send

warships from the Pacific coast round Cape Horn in order to reach the Eastern States. A canal across Panama was therefore decided upon. With this object in view a concession was obtained from the Panama Republic, and a canal zone about ten miles wide was leased to the United States. The work was begun in 1901, and the canal was informally opened to commerce in August 1914.

The chief difficulties which had to be faced in constructing the canal were :—

(*a*) the unhealthiness of the climate ;

(*b*) the flooding of the country by tropical rains ;

(*c*) the ridge of mountains which traverses the isthmus.

Malaria and yellow fever have been almost abolished in the canal zone by improving the drainage of the towns, and by oiling the stagnant pools to kill the larvae of the infection-bearing mosquitoes.

To regulate the flood water of the tropical rains a great dam has been constructed at Gatun across the valley of the River Chagres. In consequence of this dam the river water has formed **Lake Gatun**, the surface of which is eighty-five feet above sea-level.

Through the mountains a passage nine miles long has been made ; this is known as the **Culebra Cut**. This was the most difficult section of the whole work, for the ridge was more than 300 feet high. Since the opening of the canal, landslides in the Culebra Cut have caused the waterway on several occasions to be closed for a time. The whole length of the waterway is about fifty miles, and the depth of water in the canal is forty-one feet.

A ship from the Atlantic now enters a dredged channel in Colon Bay, and proceeds to Gatun. Here the ship is raised eighty-five feet in locks (there is a double set of locks so that another ship may be lowered at the same time), and then crossing Gatun Lake through a marked channel and passing through the Culebra Cut it reaches the locks at

Pedro Miguel and Miraflores, where it is lowered to the level of the Pacific.

The Panama Canal is of special importance to the United States :

(*a*) for naval purposes ;
(*b*) for commercial trade between the Atlantic and Pacific coasts.

It provides also a very direct route from Great Britain to New Zealand and Australia, and it is an alternative route for ships trading between Western Europe and China. The canal route is also of advantage to the countries on the Pacific side of South America.

From New York to Yokohama there are now two possible sea routes without crossing the Equator ; the first, *via* the Panama Canal, is 3700 miles shorter than the second, *via* the Suez Canal.

It is interesting to note that a journey from New York to Manila *via* the Panama Canal is practically the same distance as that *via* the Suez Canal.

EXERCISES.

1. Compare the commercial importance of the Suez Canal with that of the Panama Canal.

2. Describe (*a*) the quickest steamship route ; (*b*) the quickest sailing ship route from London to Calcutta.

3. Why is the North Atlantic traversed by more large steamers than any other ocean? Mention the chief steamship routes on the North Atlantic.

4. Why are sailing ships still used both in coasting trade and in trans-oceanic trade?
In what ways are steamers preferable to sailing ships?

THE UNITED KINGDOM.

CHAPTER X.

THE BRITISH ISLES—AGRICULTURE AND PASTURAGE.

1. Find the population per square mile of (*a*) Great Britain, (*b*) Ireland.

AREA AND POPULATION.

	Area in sq. miles.	Population. Census 1911.
Great Britain - - -	88,729	40,830,000
Ireland - - - - -	32,368	4,391,000

2. Make a percentage table showing the different kinds of land in (*a*) Great Britain, (*b*) Ireland. Draw diagrams as in Fig. 9 to represent the different kinds of land.

DIFFERENT KINDS OF LAND.

	Total Area. 1000 acres.	Woods and Plantations. 1000 acres.	Mountain and Heath, Grazing Land. 1000 acres.	Permanent Pastures. 1000 acres.	Arable Land. 1000 acres.
Great Britain -	56,804	2,782	12,875	17,446	14,648
Ireland - -	20,731	302	No return available	9,767	4,043

Occupations of the people.—From the tables given above it will be seen that Great Britain is nearly three times

as large as Ireland, but it contains nearly ten times as many people; the total population of the British Isles is about 45 millions of people. Food, clothing and other necessaries of life are needed by all these people, and many other articles are in demand.

A large number of people are occupied in agricultural work; many farmers not only cultivate arable land, but they also graze sheep and cattle on pasture land. Together with the fishermen, these farmers are helping to provide some of the food required by this great population.

Other men take a product and subject it to various processes, so that in its new form it becomes an article of commerce; the article is then said to have been manufactured from the raw material (*i.e.* the original product). In Great Britain the number of people engaged in industrial pursuits far exceeds those engaged in agriculture, commerce and mining taken together. In Ireland the agricultural population comes first in point of numbers.

Distribution of land.—It is important to notice (see table, p. 88) that Great Britain is still largely devoted to **agriculture** and **pasturage**. Fifty-six per cent. of the area of Great Britain is used for this purpose, and one acre in every four is arable land. In the case of Ireland, however, about half the area of the whole country is used for grazing; this is due chiefly to the heavy rainfall, which makes the land more suitable for grass than for crops. In proportion to its size, Ireland has far more cattle than Great Britain, and the damp pasture land has helped to make Ireland noted for dairy farming. Bacon, eggs, butter and cheese are all produced in great quantities, and they are mostly consumed in Great Britain.

The large number of **sheep** in Great Britain is very noticeable (page 91, ques. 3). The chief areas for sheep are the Cheviot Hills and the mountains of Wales; they also thrive on chalk hills, such as the North and South Downs, and on

the limestone formation, such as the Pennines, the Wolds of Yorkshire and Lincolnshire.

Cattle are reared on the Highlands of Scotland, but the pasturage is poor, consequently the cattle have to be sent to the richer grasslands of Ayrshire and other Lowland counties to be fattened for market. Cattle are also reared in large numbers in Ireland and in the western lowlands of England. In all parts of England, cows are kept to supply the towns with milk. Fresh milk cannot stand a long journey, and so foreign milk cannot be imported except in a preserved state.

Sheep and cattle are killed in large numbers every week to supply the meat markets of the large cities. Scotch beef, South Down mutton, Welsh mutton, are well known for their quality, but the supply is totally inadequate to the demand. So also is the home supply of dairy produce insufficient, and consequently large quantities of butter, cheese, eggs and other articles have to be imported from foreign countries and from British colonies.

EXERCISES.

1. From the subjoined table compare Great Britain and Ireland as regards industries.

CHIEF CLASSES OF OCCUPATION.

	Great Britain.	Ireland.
	Thousands.	Thousands.
Agricultural Population - -	1,311	855
Industrial ,, - -	9,548	639
Commercial ,, - -	2,104	98
Fishing ,, - -	79	21
Mining ,, - -	1,096	—

2. Compare Great Britain and Ireland as regards the production of (*a*) cereals, (*b*) root crops.

CHIEF CROPS GROWN IN THE BRITISH ISLES.

	Great Britain.	Ireland.
	1000 bushels.	1000 bushels.
Wheat	58,764	1,630
Barley	54,922	7,062
Oats	116,274	52,662
Beans and Peas	12,260	80
	1000 tons.	1000 tons.
Potatoes	3,539	3,242
Turnips	21,876	5,071

3. In proportion to its size Great Britain has more sheep than Ireland, but Ireland has more cattle than Great Britain; give reasons for this.

Of what uses are horses, cattle, sheep, pigs to the people of Great Britain and Ireland?

DISTRIBUTION OF DOMESTIC ANIMALS.

	Horses.	Cattle.	Sheep.	Pigs.
	1000	1000	1000	1000
Great Britain	1,584	7,048	26,565	2,552
Ireland	576	4,737	3,962	1,340

4. On an outline map of the British Isles shade in different colours the chief areas of (*a*) highland (*b*) lowland. From the description in Chapter X. find the chief uses to which the land is put, and enter these facts on the map.

CHAPTER XI.

THE INDUSTRIAL AREAS.

1. (*a*) Find the total value of the raw cotton imported into the United Kingdom; make a percentage table (using the subjoined values), and then draw a diagram to represent the raw cotton imported at the various ports.

(*b*) In the same way draw a diagram for imported wool.

IMPORTATION OF RAW COTTON.

Port.	Quantities. 1000 centals.[1]	Value £1000.	Port.	Quantities. 1000 centals.	Value £1000.
Liverpool -	17,907	53,967	Glasgow -	15	39
Manchester -	3,826	13,314	Belfast -	344	978
Hull - -	206	769	Other ports	24	103
London -	614	1,685			

IMPORTATION OF WOOL (SHEEP'S OR LAMBS').

Port.	Quantities. 1000 lbs.	Value. £1000.	Port.	Quantities. 1000 lbs.	Value £1000.
London -	525,401	21,931	Manchester -	223	11
Hull - -	39,390	1,473	Southampton	51,006	2,115
Goole - -	10,100	651	Glasgow -	700	35
Liverpool -	161,101	6,124	Other ports -	12,536	635

2. Draw a sketch map of the six northern counties of England; shade the industrial areas described in this lesson

[1] 1 cental = 100 lbs. Av.

and mark the chief industrial towns; in red ink mark the industries.

History of industry.—Down to the reign of Elizabeth, England was practically an agricultural country. Cereals and root crops were cultivated extensively on the fertile lands; and on the hill ranges—the Downs, Chilterns, Cotswolds and others—sheep were pastured in large numbers. The industry of **weaving wool** had been introduced by Flemings in Edward III.'s reign, but in the time of Elizabeth many refugees from the Netherlands and from France came to this country and carried on their industries of weaving wool, linen and silk. Many Englishmen were also engaged in these industries. Hitherto the weavers had lived almost entirely in the towns and villages of the eastern and south-eastern counties, *e.g.* Norwich, Yarmouth, Canterbury, etc.; the west of England now became important for broadcloth, the West Riding of Yorkshire for weaving, and Honiton in Devonshire for lace.

Until the middle of the eighteenth century weaving was a **domestic industry**. That is, the work was done by hand in the houses of the weavers, but many weavers spent part of their time in agricultural work.

Industrial revolution.—During the latter half of the eighteenth century many changes took place; coal mining and iron smelting (with coal as fuel) became really important; machines for spinning and weaving were invented; and, as water power was used, factories were built at the side of streams. The application of steam power to machinery brought about a great development in the industry of weaving. Large factories were built on the coalfields, where fuel could be obtained most economically.

Many important results followed this development of industry:—

(1) a shifting of the population: large numbers of people were attracted to the manufacturing districts where

employment could be obtained in the factories; hence, except in the London area, the south and south-east ceased to be the most densely populated parts of England.

(2) the need for improved means of communication: the introduction of railways belongs to the nineteenth century and to the industrial areas, *e.g.* the railway from Stockton to Darlington, from Manchester to Liverpool, etc.

(3) the importation of raw materials in large quantities: in the large factories the home supply of raw wool soon appeared to be inadequate, and colonial and foreign wool had to be imported. Similarly, the amount of raw cotton imported from America increased rapidly to satisfy the greater demand.

(4) the importation of food products: Russian wheat was first obtained, and then (because of the Crimean War) American wheat, etc.

Northumberland and Durham.—From this coalfield coal was first exported. In order to do this, wooden colliers had to be built to carry coal to London and other places on the coast of England. From this early period (fifteenth century) the **shipbuilding** industry on the Tyne has always been important, and it has continued to develop owing to the smelting of iron ore at Middlesbrough and the preparation of materials for shipbuilding. At the **Elswick** works (Newcastle) ships of the largest size, including ironclads, are now constructed. Along both banks of the Tyne from Newcastle to Shields there are shipbuilding yards; also at the mouths of the Wear (Sunderland) and Tees (Hartlepool).

This coalfield does not form a great manufacturing district like South Lancashire or the West Riding of Yorkshire, but in some respects it resembles South Wales. The chief imports to the Tyne and Wear are grain and timber for

local use. **Stockton** and **Darlington** are noted for large engineering works; **Newcastle** for machinery and **Jarrow** for chemicals.

The West Riding of Yorkshire.—On this coalfield enormous quantities of coal are raised (p. 64); much of it is used in the factories of the district, some of it is sent by rail to other parts of England and some is exported from Hull, Grimsby, or Goole. The **woollen industry** became established in the valleys of the West Riding partly because of the raw wool obtained from the sheep of the Pennines, and partly because of the streams which provided water power. At the present time many disused mills—small in size and in a state of ruin—may be seen in some of the valleys. They are no longer needed, as large factories on the coalfield are now supplied with steam and electric power.

The woollen towns of the West Riding specialise as a rule in some branch of the industry, *e.g.* **Leeds** is noted for ready-made clothing; **Bradford** for mohair goods; **Huddersfield** for broadcloth; **Halifax** for carpets; **Dewsbury** for blankets; and **Batley** for shoddy.

Iron and Cutlery.—Iron ore is obtained from this coalfield, and is smelted at **Rotherham**. **Sheffield** on the Don has a world-wide reputation for cutlery; the industry arose because the sandstone of the neighbourhood provided good grindstones for sharpening tools; water power was also available for turning the grindstones. Besides cutlery, Sheffield now manufactures other articles, *e.g.* machinery for the factories, silver and electro-plated goods, etc.

South Lancashire and Cheshire.—The coal obtained from the South Lancashire coalfield is either used in the factories of the district or it is sent from Wigan to other parts of England; very little is exported.

Cotton spinning is the chief industry of South Lancashire. As the prevailing winds are from the west, the rainfall on the

west side of the Pennines is heavy, and the atmosphere is always moist. This moist atmosphere is an advantage for cotton spinning, as damp threads do not break very readily. **Raw cotton** must be imported from tropical or sub-tropical regions. Until recently the whole supply came from the United States to Liverpool, a port most conveniently situated for American trade. For these reasons the cotton industry became localised in South Lancashire. The chief processes of the industry are spinning, weaving, dyeing and printing; they are all carried on on this coalfield.

Manchester (with Salford) is the largest centre of population and industry in South Lancashire. It is a city of warehouses, in which are stored the goods made in the spinning towns, **Oldham**, **Bolton**, **Bury**, **Blackburn**, **Burnley** and many others. Manchester is also a distributing centre for goods brought to it by numerous railways and by the Manchester Ship Canal. Engineering works supply many of the factories with machinery.

Salt mining is an important industry in Southern Cheshire, Nantwich, Middlewich, Northwich being the chief centres of production. Large quantities of salt are carried along the Weaver and Mersey Canal to be used in the **chemical works** at **Runcorn** and at **Widnes**. In these works, alkali, ammonia, dyes, etc., are manufactured, and they are used in the factories of South Lancashire.

EXERCISES.

1. Write an account of the Industrial Revolution and of the changes which resulted from it.

2. Compare the commercial importance of the following estuaries: Tyne, Humber, Mersey.

3. Why has the cotton industry become localised in South Lancashire, the woollen industry in the West Riding of Yorkshire, and the shipbuilding industry on the Tyne?

4. Compare Liverpool and Manchester as ports for the importation of raw cotton. State as many facts as possible from the following table:

IMPORTATION OF RAW COTTON INTO LIVERPOOL AND MANCHESTER.

Countries whence consigned.	Liverpool.		Manchester.	
	Quantities. 1000 centals.[1]	Value. £1000.	Quantities. 1000 centals.	Value. £1000.
United States of America	14,415	40,754	2,269	6,317
Egypt	2,334	9,717	1,535	6,949
British India	384	991	5	13
Nigerian Protectorate	38	110	—	—
Brazil	336	1,158	—	—
Peru	269	915	—	—
Other countries	131	322	17	35

[1] 1 cental = 100 lbs. Av.

5. Write an account of the history of the wool trade in England.

Point out the connection of London with the wool trade.

6. Describe the position of the following:—Newcastle, Leeds, Sheffield, Oldham, Widnes.

In the case of each town state its industrial importance.

CHAPTER XII.

THE INDUSTRIAL AREAS (CONTINUED).

1. From the description in this lesson write in tabular form (i) a list of the industrial areas, (ii) the chief towns, (iii) the important industries.

2. Draw a sketch map of that part of Scotland in which there are coalfields. Name the coalfields and mark the towns noted for the exportation of coal, the smelting of iron, and the manufacture of textiles.

The Black Country.—The South Staffordshire coalfield is noted for the deposits of iron ore which occur in layers alternating with the seams of coal. For many centuries the making of **iron goods** has been carried on in this district. The iron ore was first smelted at Birmingham with charcoal brought from the forest of Arden. The use of coal in smelting iron ore was first tried with success at Coalbrookdale, near the Severn, but coal was soon used in the furnaces at Dudley in South Staffordshire. It was also found that Stourbridge clay made excellent fire bricks for lining the blast furnaces, and that limestone was useful as a flux.

The advantage of procuring all these things in the district helped to establish the iron industry in the Black Country. Although **Birmingham** is not actually on the coalfield, it is the centre of the industrial area, and is noted for the manufacture of all kinds of metal goods, to which the general name **hardware** is given. Tools, rifles, bicycles, are all

included under this general name. **Wolverhampton, Walsall, Wednesbury, West Bromwich** are important towns in the Black Country.

The position of the Black Country in the centre of England is a disadvantage as regards sea-borne goods. Birmingham is about eighty miles from Liverpool and from Bristol, and about a hundred miles from London. Gloucester, fifty miles

Fig. 46.—Factories with tall chimneys.

away, is the nearest port to Birmingham, but the approach from Birmingham is somewhat steep and difficult. Gloucester is connected with the sea by an artificial waterway, and its growth as a seaport is necessarily restricted. Birmingham has excellent railway communication, and canals connect it with the estuaries of the Thames, Humber and Mersey.

The Potteries.—The North Staffordshire coalfield is known as the Potteries. In the eighteenth century the making of pottery became important in this district because of the discovery of clays suitable for **china** and **earthenware.** The local clays are still used for the commoner kinds of ware,

but for the making of porcelain and other fine wares, **kaolin** or china clay is brought from Devon and Cornwall to the Mersey, and thence by canal to the Potteries. It is more economical to take the china clay to the coalfield than to carry coal to Cornwall. The chief reasons for this are

(*a*) the earthenware industry has been established for a long time in North Staffordshire, and kaolin is only one of the raw materials used;

(*b*) a skilled population already lives on the coalfield, and furnaces and other necessary plant are already in use;

(*c*) a plentiful supply of fuel is found in the district.

The chief centres are **Stoke-upon-Trent, Burslem** and **Hanley.**

South Wales and Monmouthshire.—The South Wales coalfield is crossed by the rivers Tawe, Neath, Taff, Rhymney and Ebbw. In the east part of the coalfield **bituminous coal** is mined; and in the central and western parts **steam coal,** or **anthracite,** is obtained. Large quantities of coal are carried by rail down the valleys to the seaports at the mouths of the rivers. The smokeless steam coal is in great demand for use on warships.

Cardiff exports more coal than any other port in the United Kingdom; but **Swansea** and **Newport** are also important for coal export.

Iron ore used to be mined extensively on the northern margin of the coal area, and consequently **Merthyr, Tredegar, Dowlais** and other towns became noted for **iron smelting.** This industry is still carried on, but iron ore is now imported from Bilbao in Spain. As the Welsh iron mines have been nearly worked out, the imported ore has to be hauled many miles inland to the smelting centres.

Swansea also became noted for smelting when tin ore and copper ore could be obtained from Cornwall and Devon respectively. The industry still survives, although copper

ore has now to be brought from the Rio Tinto Mines in Spain, and tin ore from the Malay States. Cardiff and

Photo. Underwood & Underwood

FIG. 47.—Shipbuilding yard on the Clyde. The ship is still on the stocks.

Swansea are both engaged in the **tin plate** industry ; that is, in covering thin sheets of iron with tin to prevent rusting.

Similarly, zinc is used in the preparation of galvanised iron goods.

The Lanarkshire Coalfield is the busiest industrial area in Scotland. Coal is obtained in large quantities, and some is exported from Glasgow and Grangemouth. The production of iron ore in Lanarkshire gave rise to the smelting industry at **Motherwell, Wishaw, Coatbridge** and other towns, and imported iron ore is now smelted at these places. At the Carron Iron Works (Falkirk) heavy iron goods are manufactured, and at **Glasgow** machinery of all kinds is made.

The shipbuilding industry on the Clyde has developed because of the production of iron and coal in the neighbourhood, and because of the artificial deepening of the waterway in the Clyde estuary. From Glasgow to Dumbarton and Greenock shipbuilding yards extend along both banks of the estuary. Marine engines and other machinery are constructed in the iron works of the district.

Glasgow is conveniently situated for trade as well as for industry. The Clyde is the only river on the west coast of Scotland which has an estuary suitable for commerce. At first the trade was with Ireland only; but now American trade is very important. The importation of American cotton has made Paisley noted for the manufacture of cotton goods and of cotton thread. Trade with the West Indies has made Greenock noted for its sugar refineries.

The Ayrshire Coalfield.—Coal and iron are sent from this coalfield to Belfast to be used chiefly in the shipbuilding yards. **Kilmarnock** is the largest town on this coalfield, and it is noted for its engineering works, and the manufacture of carpets and of railway rolling stock.

The Fifeshire Coalfield.—Coal is exported from Methil and Burntisland. **Linen weaving** is important at Dunfermline; oilcloth and linoleum are made at Kirkcaldy.

Ireland.—The only industrial area of importance in

Ireland is in **Ulster.** In the seventeenth century many men from England and Scotland settled in Ulster; to these settlers belong the cultivation of flax and the introduction of the linen industry. Flax is still grown, but linen yarn is imported from Belgium. Irish linen is noted for its whiteness, and this is probably due to its being bleached in the open air. Very fine weaving is done in many small towns, such as Armagh, and in **Belfast** there are large linen factories. **Londonderry** specialises in shirtmaking.

Shipbuilding is an important industry at Belfast. The materials required for this industry have to be brought from Scotland. The suitability of the site on Belfast Lough, the cheapness of the land, the depth of the water, but more especially the enterprise and mechanical skill of the founders of the shipyards, were probably the factors which led to the establishment of shipbuilding at Belfast.

EXERCISES.

1. In what districts of Great Britain are the following industries carried on:—Hardware, earthenware, tinplate? Give some account of each industry.

2. Name the Scottish coalfields, and describe the industries carried on upon them.

3. Write an account of the linen industry (*a*) in Ireland, (*b*) in Scotland.

4. Mention *one* shipbuilding centre in each of the following countries:—Scotland, England, Ireland.

In the case of each district explain why the industry is carried on at that particular place.

What materials are required in the shipbuilding industry, and where are they obtained?

CHAPTER XIII.

BRITISH COMMERCE.

IMPORTS—VALUES.

	United Kingdom.	United States.	Germany.
	£1,000,000.	£1,000,000.	£1,000,000.
1905	565	224	372
1906	608	245	422
1907	646	287	450
1908	593	239	404
1909	625	262	443
1910	678	311	465
1911	680	305	500
1912	745	350	506
1913	769	363	535

EXPORTS—VALUES.

	United Kingdom.			United States of America.	Germany.
	Produce and Manufactures of U.K.	Foreign and Colonial Merchandise.	Total Value.		
	£1,000,000.	£1,000,000.	£1,000,000.	£1,000,000.	£1 000,000.
1905	330	78	408	299	293
1906	376	85	461	344	324
1907	426	92	518	371	355
1908	377	80	457	367	324
1909	378	91	470	328	343
1910	430	104	534	340	382
1911	454	103	557	403	411
1912	487	112	599	434	437
1913	525	110	635	486	496

1. Find the average values of the imports for the period 1905-13 for each of the three countries in the foregoing table. Also find the average values of the exports.

2. By how much does the value of the imports in 1913 exceed the value in 1905 in each country? Also find the increase in value of the exports.

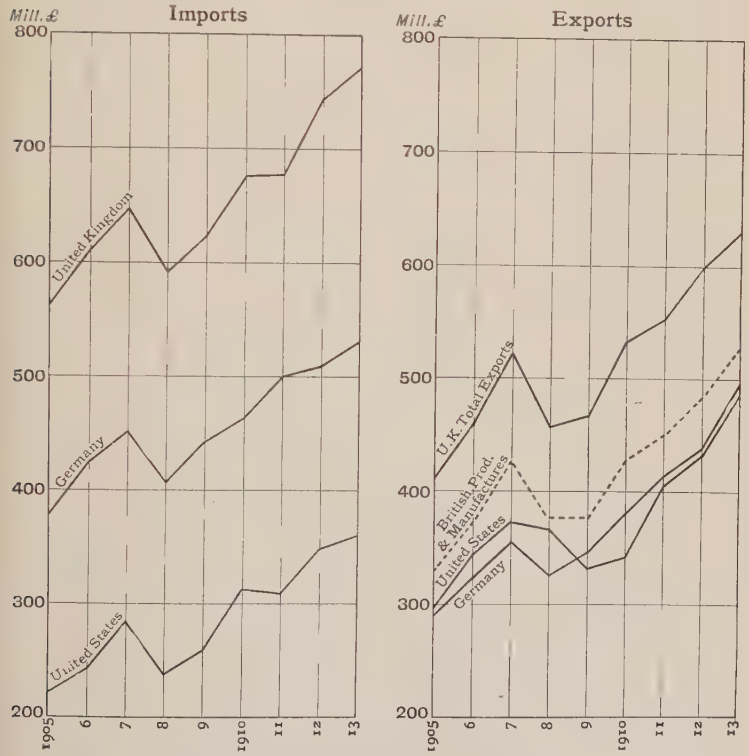

FIG. 48.—The diagrams represent the values given in the foregoing tables (p. 104).

History of commerce.—The commercial activity of England dates from the time of Elizabeth. Before that period there was a small trade in wine with Bordeaux and

other French ports. Bristol traded in Irish goods also. Once a year the Venetian fleet visited Southampton and brought eastern products, such as silks, cottons, damasks, spices, etc.; the last visit of the Venetian fleet was in 1587. From the fourteenth century the products of Northern Europe, such as furs, timber, amber, etc., were brought to this country by Hanseatic merchants to be exchanged for English cloth. (The Hansa was a league of merchants which had its headquarters at Lübeck in Germany; the object of the league was to protect the interests of the merchants.) In 1597 the Hanseatic depot in London was given up, a fact which shows that English merchants were beginning to take an active part in maritime trade.

During Elizabeth's reign began the struggle with Spain in which English merchants and adventurers tried to gain some share of the wealth of the New World. The attempts to found a colony in Virginia failed at first, but a little later permanent settlements were made both in Virginia (1607) and in the New England States (1620). These settlements began the formation of our colonial empire, and in course of time considerable trade grew up between England and her colonies.

In 1600 the English East India Company was formed in London. Several expeditions were sent out to the East Indies and valuable cargoes of spices were brought to this country. The opposition of the Dutch and Portuguese made British merchants turn to India, where trading stations were soon established at Madras, Surat and other places. Down to the middle of the seventeenth century the Dutch monopolised the carrying trade of the world, but the destruction of the Dutch fleet in 1654 gave a great impetus to English commerce.

During the eighteenth century the struggle with the French in North America and in India ended in our favour. At the close of the Napoleonic Wars, in 1815, continental nations

were left exhausted; Great Britain, however, was left supreme on the sea, and she was also ready through the Industrial Revolution (p. 93) to supply Europe with manufactured articles. Her trade therefore increased very rapidly.

British commerce.—At the present time the commerce of the **United Kingdom** is greater than that of any other country of the world; the only countries that can be looked upon as serious competitors are **Germany** and the **United States of America**.

The value of the articles imported into the United Kingdom far exceeds that of either Germany or the United States. This is partly accounted for by the fact that Great Britain has to import such enormous quantities of food, while its two rivals produce more food than they require. The total value of articles exported from the United Kingdom is also greater than that of Germany or the United States. If British products only be considered, then the superiority of the United Kingdom is not so marked. All three countries are now exporting large quantities of manufactured goods, and it is in this trade that they are keenly competing with each other.

British imports and exports.—From the table on page 104 it will be seen that the value of British imports for 1913 was 769 million pounds sterling, and of British exports 635 million pounds. This does not mean that the United Kingdom gained the difference between the two values (134 million pounds). The difference between the value of the imports and exports is called the *balance of trade*; if this difference be regarded in terms of goods (or their values) the balance is largely in our favour, but if it be regarded in terms of credit then the balance is decidedly against us. Two factors, however, tend to adjust the balance of trade. In the first place, the use of British ships in the carrying trade of the world must be taken into consideration, and the cost of this service for the year must be added to the value of the exports. In the second place, much British capital has been invested

abroad; the annual interest due on this invested capital is not necessarily paid in money, but it is largely paid in products which enter the United Kingdom as imports.

Two kinds of exports.—Goods exported from British seaports may be classified as

(1) produce and manufactures of the United Kingdom;

(2) foreign and colonial merchandise.

Many articles which are not for use in the United Kingdom are brought to our seaports from foreign countries and from British colonies. Some of these articles are not even landed, but are trans-shipped and sent away to their destination. Some of them are warehoused for a time, and in certain cases are repacked before being sent away. As these goods have not undergone any essential change they are called exports of foreign and colonial merchandise. To this kind of trade the term **entrepôt** is applied; a list of ports with entrepôt trade is given (p. 111), and it should be noted that with the exception of London and Liverpool the amount of such trade is small.

If, however, articles from foreign countries or from British colonies are manipulated to any extent by workmen in this country, they are said to have had a British character imparted to them, and in that case they are exported as British produce or manufactures. For example, nearly all the sealskins imported into this country come from the United States of America; they are dressed in England, and, although in some cases they are sent to be dyed in France, they are exported as British goods.

EXERCISES.

1. Give some account of the development of British commerce since the time of Elizabeth.

2. Explain the terms (*a*) balance of trade;
(*b*) entrepôt trade.

3. How is it that Germany has become a rival of Great Britain in the markets of the world?

CHAPTER XIV.

THE CHIEF SEAPORTS OF THE UNITED KINGDOM.

1. Rewrite the following articles of export in order of their value; opposite each article write the name of a district or town connected with the trade in that commodity.

PRINCIPAL EXPORTS FROM THE UNITED KINGDOM.

Article.	Value. £1000.	Article.	Value. £1000.
Coal	37,109	Woollen Tissues	12,541
Iron and Steel Goods	43,382	Worsted Tissues	7,072
Cotton Yarn	14,261	Apparel (boots, hats, etc.)	13,019
Cotton Goods	94,858	Fish	5,786
Linen Goods	5,901		
Woollen and Worsted Yarn	5,982		

2. Classify, so far as possible, the articles in the subjoined table under the following headings:—Cereals, meat, drink, dairy produce. State the value of each group of imports.

PRINCIPAL IMPORTS INTO UNITED KINGDOM.

I.—Food and Drink.

Article.	Value. £1000.	Article.	Value. £1000.
Wheat	43,673	Butter	23,986
Wheatmeal and Flour	5,667	Cheese	7,050
Maize	11,681	Eggs	7,723
Barley	7,171	Fruits (fresh and preserved)	14,545
Oats	5,498	Sugar (refined and unrefined)	27,000
Animals (for food)	3,616	Tea	14,798
Bacon	14,053	Wine	4,112
Beef	13,571		
Mutton	9,546		

3. Rewrite, in tabular form, the subjoined imports in order of value; opposite each write the name of one country or district from which the raw material is obtained.

PRINCIPAL IMPORTS INTO UNITED KINGDOM.

II.—Raw Materials.

Article.	Value. £1000.	Article.	Value. £1000.
Cotton (raw)	70,850	Leather (dressed and undressed)	10,159
Wood and Timber	26,003	Iron Ore	5,679
Wool	32,978	Iron and Steel Goods	10,296
Rubber	20,037	Tin	7,618
Oil Seeds (cotton, flax, rape)	9,271	Copper	8,100
		Petroleum	6,207

4. Write a list of the following seaports where the value of the exports exceeds the value of the imports; in each case note by how much the exports are greater than the imports, and, where possible, give a reason for it.

CHIEF PORTS OF THE UNITED KINGDOM.

Ports.	Imports.	Exports.	Total Value.
	Million £.	Million £.	Million £.
London	225·8	132·4	358·2
Liverpool	164·5	172·7	337·2
Hull	42·9	30·0	72·9
Manchester	31·6	18·8	50·4
Southampton	22·0	24·8	46·8
Glasgow	15·3	30·5	45·8
Grimsby	13·1	18·6	31·7
Harwich	22·2	7·4	29·6
Leith	14·7	7·1	21·8
Newcastle	9·6	10·6	20·2
Bristol	15·6	3·9	19·5
Cardiff	6·1	13·0	19·1
Goole	8·6	10·5	19·1
Newhaven	12·3	6·4	18·7
Folkestone	11·9	2·8	14·7
Dover	7·8	6·3	14·1
Swansea	3·6	7·9	11·5
Middlesbrough	2·3	8·6	10·9
Belfast	8·6	1·4	10·0
Dundee	5·3	1·0	6·3

5. On an outline map mark the seaports in the foregoing table.

6. What is meant by (*a*) United Kingdom produce and manufactures, (*b*) foreign and colonial merchandise? Make a table showing the percentage of the foreign and colonial merchandise to the total value of the exports.

VALUE OF EXPORTS FROM SELECTED PORTS.

Ports.	Produce and Manufactures of United Kingdom	Foreign and Colonial Merchandise.	Total Value.
	Million £.	Million £.	Million £.
London - - - -	80·2	52·2	132·4
Liverpool - - - -	144·9	27·8	172·7
Hull - - - -	24·6	5·4	30·0
Southampton - - -	18·0	6·8	24·8
Harwich - - - -	5·1	2·3	7·4
Newhaven - - -	4·2	2·2	6·4
Folkestone - - -	1·8	1·0	2·8
Dover, . - - - -	4·0	2·3	6·3
Belfast - - - -	·5	·9	1·4

British Seaports.[1]—On looking at the list of British seaports (p. 110) it will be noticed:

(*a*) that the value of the imports and exports of London and Liverpool—695 million pounds—is greater than that of all other British seaports taken together;

(*b*) that the total value of the imports and exports of London is slightly in excess of that of Liverpool;

(*c*) that in the case of most ports the value of the imports exceeds the value of the exports, but in a few cases, especially the coal exporting ports, *e.g.* Cardiff, Swansea, Glasgow and others, the value of the exports exceeds that of the imports.

London.—In the course of centuries London has developed its enormous trade. In addition to its commerce,

[1] In reading this chapter constant reference should be made to the lists of Imports and Exports in Appendix I., pp. 131-5.

London has gradually become a great manufacturing centre. To the east of the City of London and along both banks of the Thames are numerous factories in which are manufactured furniture, iron goods, soap, candles, sugar, chocolate, linoleum, etc. The Port of London provides accommodation for great numbers of ships; the largest ships entering the Thames load and unload in **Tilbury Dock** (opposite Gravesend), as the depth of water above Tilbury is at present only sufficient for vessels of moderate draught. Between Woolwich and London Bridge, a distance of ten miles, are many docks (see Fig. 49); many ships, however, do not enter the docks, but lie either alongside the wharves which stretch along both banks, or they are moored in the stream, their cargoes being transferred to lighters. Goods in vast quantities and of infinite variety are brought to London; a list of the principal articles is given (p. 131), and it should be noted that London is the chief **wool market**; it is also the chief centre of the trade in **tea**.

Some of the articles imported are used in London itself, others are distributed to various parts of England. Some foreign and colonial goods enter the Thames, and without undergoing any change they are exported again; goods to the value of fifty-two million pounds are dealt with every year in this way. This **entrepôt trade** has in recent years been injured to some extent by the competition of continental ports; certain kinds of goods which once entered the Thames now go direct to Antwerp, Hamburg, or other ports.

Harwich, **Dover**, **Folkestone** and **Newhaven** may be looked upon as outports of London for continental traffic both in passengers and goods.

The Mersey Ports.—Between the Bristol Channel and the Firth of Clyde the Mersey is the only estuary deep enough for shipping. The trade of **Liverpool** began first with Ireland, then with Africa in slaves, later with the West Indies in sugar and tobacco, and finally with the United

FIG. 49.—The industries of London. The dotted area alongside the river is that which, in the absence of artificial embanking, is marshy ground, liable to be flooded at high tide.

States in cotton. During the last 150 years the trade of Liverpool has developed rapidly, until at the present time Liverpool trades with all parts of the world, and the value of its trade is almost equal to that of London.

Liverpool has easy communication by canal and railway with the great industrial areas of South Lancashire, the West

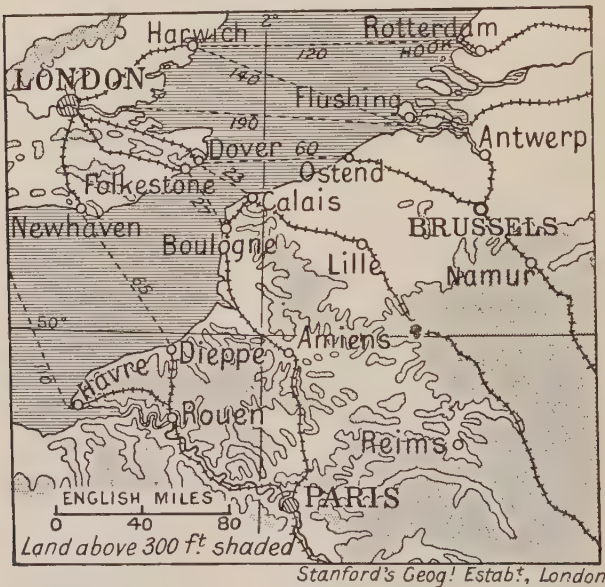

FIG. 50.—Routes from London to the Continent.

Riding of Yorkshire, the Potteries, the Black Country, and many others. From all these areas manufactured goods can be sent to Liverpool for export; raw materials can be imported into Liverpool for use in the factories and works; while food products can be brought from distant lands to supply the dense populations of these areas.

The port of Liverpool includes **Birkenhead**, on the

Cheshire side of the Mersey, and **Garston**, east of Liverpool. The docks of Liverpool are superior to those of London; they extend for nearly seven miles along the Lancashire side of the estuary, and the largest liners can be accommodated in them.

At Birkenhead is the **Great Float**, a natural basin which has been turned into a dock: this dock is nearly two and a half miles long, and near it are shipbuilding and engineering works.

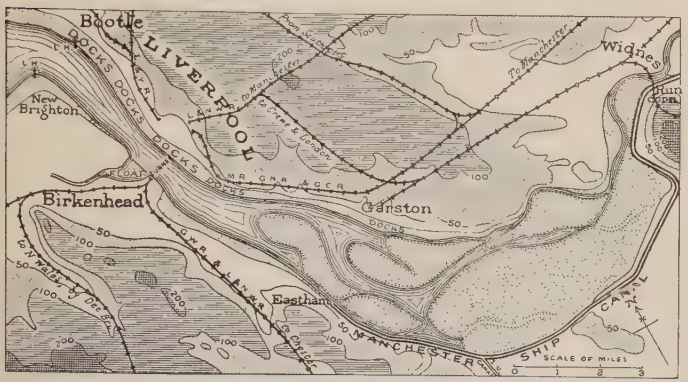

FIG. 51.—The Mersey estuary. At high tide the dotted areas are covered with water. The Ship Canal enters the Mersey estuary at Eastham.

The headquarters of the Cunard Company, the White Star, and other great shipping companies are centred at Liverpool. In spite of the rivalry of Manchester, Liverpool remains pre-eminent as the **cotton port** of Great Britain; at the present time the value of the cotton imported is one third that of the total imports.

Manchester.—Since the opening of the **Ship Canal** in 1894 Manchester has steadily developed as a seaport. Raw cotton is the most important article carried up the canal to Manchester, and nearly all of it comes from the United States and from Egypt; wheat from Canada is the article

next in value to cotton. Cotton goods and machinery are the chief articles exported from Manchester.

The Humber Ports.—**Hull** is a very old seaport. It has trade with the countries of the Baltic and of Western Europe; the Wilson Steamship Company now trades with America. Timber is imported from Scandinavia and Russia; butter and eggs from Denmark and Holland; wheat from Russia and America; coal and manufactured articles (machinery, woollen goods, and others) from the West Riding are exported, as well as cotton goods from South Lancashire. Although Hull is near the woollen towns of Yorkshire, Hull is not the chief port for raw wool; larger quantities are imported at London, Liverpool and Southampton.

Goole is a rapidly developing port because of its nearness to the manufacturing centres.

Grimsby, noted as a fishing port, now exports coal, and has trade with Antwerp and Rotterdam.

Southampton is at a great distance from the industrial areas, but it is not far from London. Southampton stands at the head of a well-sheltered estuary, which has the advantage of four tides in twenty-four hours. The trade of Southampton with France (*via* Havre, St. Malo and Bordeaux) dates back for many centuries, and it is still important. Steamers belonging to the Union-Castle Company start from Southampton for South Africa, as well as Royal Mail steamers for the West Indies and South America. Some liners for New York also start from this port and call at Cherbourg for continental passengers. Among the imported articles of commerce are raw wool and ostrich feathers from South Africa, fruit from the West Indies and Canary Islands, coffee from Brazil, silk goods from France, and early vegetables from the Channel Islands. Lace and other goods from N.E. France are brought to Dover, sent by train to Southampton, and are then exported in the liners leaving that port.

Bristol Channel Ports.—**Bristol** is a very old port, and has always been noted for Irish trade; it imports agricultural

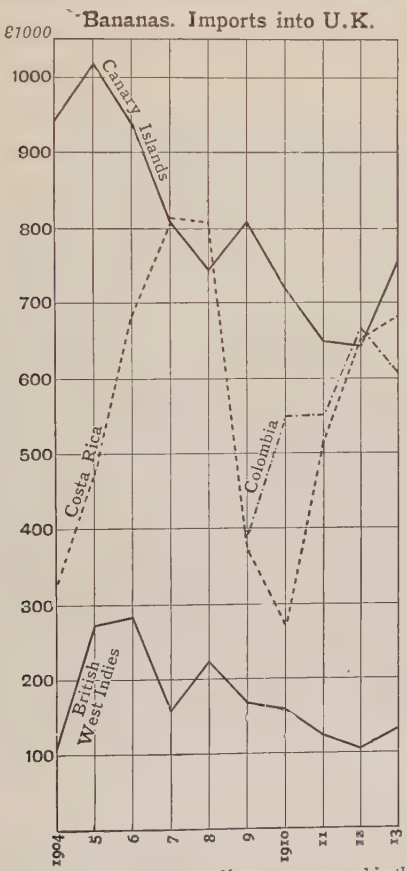

FIG. 52.—Diagram to show the value of bananas consumed in this country.

produce from Cork, Waterford and Wexford. To **Avonmouth**, the outport of Bristol, steamers bring tobacco, sugar and bananas from the West Indies.

Cardiff and **Swansea** export steam coal to naval powers such as Germany, France and Italy. Ores are imported for smelting.

Scottish Ports.—**Glasgow** is the centre of the chief industrial area of Scotland, and it is situated on the only

Fig. 53.—Banana trees with fruit.

good harbour on the west coast. Its trade is chiefly with Ireland, Canada and the United States.

Leith and **Dundee** import Baltic products, especially timber and flax; jute is brought to Dundee from Calcutta.

Coal is exported from Glasgow, Grangemouth, Methil and Burntisland.

Irish Ports. – **Belfast** is the only great industrial centre in Ireland, the manufacture of linen goods and shipbuilding being the chief industries. The shipping of Belfast is mostly with Great Britain. Coal and iron are imported from Scotland. Belfast is in daily communication with Great Britain *via* Liverpool, Heysham and Stranraer.

Dublin is most conveniently situated for the exportation of agricultural produce from the Central Plain and southern districts of Ireland. It is in direct communication with Liverpool, but passengers and mails travel *via* Holyhead. Steamers also run daily from Holyhead to Greenore and from Fishguard to Rosslare. Some Atlantic liners for New York call at Queenstown, and others for Montreal at Moville on Loch Foyle.

EXERCISES.

1. Compare the advantages and disadvantages of Liverpool and Southampton for American liners.

2. Describe the positions of the places from which bananas are brought to England. From Fig. 52 find the total value of bananas imported for each of the years 1904-1913.

3. Into what British ports are the following goods chiefly imported : timber, wool, cotton, tea, sugar? In each case point out the suitability of the port for the trade.

4. From Fig. 51 describe the Mersey estuary and the land near it.

Where does the Manchester Ship Canal enter the estuary?

5. State the position and importance of :—Avonmouth, Grimsby, Birkenhead, Tilbury, Leith and Harwich.

CHAPTER XV.

TRADE OF THE UNITED KINGDOM.

THE value of merchandise consigned from the countries in the subjoined table to the U.K. is given under Imports.

The value of merchandise consigned to the various countries from the U.K. is given under Exports.

Foreign Countries.	Imports.	Exports.	British Possessions.	Imports.	Exports.
	Million £	Million £		Million £	Million £
United States,	124	60	British India -	44	51
Germany -	63	54	Australia -	37	31
France - -	44	34	Canada - -	26	22
Russia - -	42	21	New Zealand -	19	10
Denmark -	20	6	British South		
Netherlands -	19	18	Africa, -	10	20
Belgium - -	21	18	Straits Settle-		
Egypt - -	22	9	ments and		
Argentine -	33	20	Labuan -	12	4
Other countries	127	175	Other British		
			possessions,	20	25
Total - -	515	415	Total - -	168	163

1. On an outline map of the world, shade the countries in the above table, distinguishing foreign countries and British possessions. Mark one seaport for each country.

2. Write in parallel columns the ten articles of greatest value imported into the United Kingdom from (1) the United States and (2) Germany respectively (see pp. 136-7).

3. Make a list of those countries to which the United Kingdom sends coal, textiles, machinery respectively.

Foreign countries.[1]—It will be noticed from the above table that the total value of the imports and exports of the United Kingdom is about 1260 million pounds sterling. The value of our trade with foreign countries is 930 million pounds; that is, we depend on foreign countries for about seventy per cent. of our trade. In reading the following notes on our trade with the various countries, reference should be made to the tables showing imports and exports (pp. 136-141). With regard to the exports from the United Kingdom, coal, textiles and machinery occur again and again. Coal is sent to countries like Denmark and the Netherlands which do not possess coalfields, and to countries like Germany and France which need anthracite (steam coal) for use in warships.

United States.—The outstanding feature of the goods imported from the United States is the enormous value of **raw cotton** (more than one-third of all the imports). Cotton is an article which cannot be grown in this country, and which at present cannot be produced in the various parts of the British Empire in large enough quantities to supply the mills of South Lancashire.

The second important feature is the great number of **food products** sent here from the United States. Bacon, hams and lard are obtained chiefly from the Chicago district, and valued at nearly twelve million pounds. Wheat, wheatmeal and maize have almost the same value; beef, fish, apples and bottled fruit are together valued at nearly three million pounds.

These two groups represent sixty per cent. of the total imports.

In return for these articles we send a large quantity of manufactured goods, especially **textiles**, of which linen goods take the first place. Iron and steel goods and chemicals are of considerable value.

[1] In reading this chapter constant reference should be made to the Imports and Exports in Appendix II., pp. 136-141.

Large quantities of **tin** from the Malay States, **rubber** from Africa and the East Indies, **palm oil** from the Guinea Coast, **kauri gum** from New Zealand pass through British ports on their way to the United States.

Germany.—**Beet sugar**, refined and unrefined, is the imported article of greatest value; the production of beet sugar for exportation is largely due to the bounties given by the Government to the manufacturers of beet sugar and to improved methods of extraction; consequently the beet sugar of Germany is able at the present time to compete with cane sugar in British markets.

Germany specialises in the production of **chemicals** and **dyes**; the success in this trade is largely the result of the careful research work of German chemists at Stassfurt, Halle and other towns. Germany has almost a monopoly of the import trade in **toys** and **games**.

Among the exports to Germany are many manufactured articles; some of these articles (*e.g.* cotton goods) appear on the list of both imports and exports; the processes of manufacture are not necessarily the same.

Steam coal from South Wales is sent in large quantities for use in German warships.

Many thousand barrels of **salted herrings** are sent from Yarmouth, Grimsby and other fishing towns, as Germany cannot compete with Great Britain in the fisheries of the Dogger Bank.

France.—Great Britain imports from France all kinds of **silk goods**—broad stuffs, lace, ribbons. Raw silk cannot be produced in this country, and the industry of silk weaving has never become really important. The French weavers in the Rhone valley (at Lyons, Avignon and other towns) are specially noted for their skill both in weaving and in dyeing silk fabrics.

Wine is imported in large quantities from the districts of Champagne, Burgundy and Bordeaux, while **brandy** comes chiefly from Cognac, near Bordeaux.

Butter, eggs, early fruit and early vegetables are sent from Normandy and Brittany to this country.

For a time France took the lead in the manufacture of **motor cars,** and many French firms still export them. English makers are now successfully competing with French makers in this trade.

The chief exports are steam coal, machinery, steel goods, textiles ; raw wool and rubber are sent to France *via* British seaports.

Russia.—Large tracts of land are covered with forests, and extensive areas are devoted to agriculture. Cereals are of the greatest value ; wheat is produced on the Black Earth district of Southern Russia, and is exported from Odessa, Nikolaiev and other ports ; barley and oats are grown in Central Russia and the Balkan provinces ; maize is cultivated in the south-west.

Butter and eggs are sent to this country in enormous quantities from the Baltic ports and from Finland.

Timber from the Russian forests is more valuable than any other single article ; the trade is chiefly carried on through Riga, Libau, Revel, Helsingfors and St. Petersburg.

Great Britain exports salted herrings packed in barrels, as Russia has not direct access to the fisheries of Western Europe.

Among the goods which reach Russia *via* British seaports may be mentioned raw cotton, rubber, tea. Years ago Russia depended entirely for her tea supply on that brought from China by land routes, she now imports some by sea.

Denmark specialises in **butter-making** ; the value of the butter is more than half that of the total imports into this country from Denmark. The success of the industry is due (*a*) to the extensive grass lands on which cattle can be kept, (*b*) to co-operative farming. The milk is collected and sent to factories, in which the butter is made by machinery ; a standard quality of butter can thus be secured. The land

is also suitable for pigs and poultry, hence bacon and eggs are produced and exported. Denmark has no minerals, hence coal is obtained from Great Britain.

Netherlands.—Two articles are of special importance (1) margarine, (2) sugar.

Margarine, a cheap substitute for butter, is driving pure butter from the market in the poor districts of all large towns. Margarine was first prepared with milk and mutton fat; it is now more largely made with cocoa-nut oil.

The importation of cocoa, sugar and some other articles is due to some extent to the fact that the Netherlands possess colonies, *e.g.* Java, Sumatra, Guiana, and from these colonies articles of commerce are obtained. The Netherlands are also noted for dairy produce, butter, eggs and condensed milk being important articles of trade; hyacinths and other bulbous plants are grown on the light porous soils round Haarlem, and are exported.

Belgium possesses coal and iron fields, Mons and Liège being the chief centres of industry; zinc is mined at Verviers. Although Belgium is a small country it has made great progress in the production of iron goods, and it now competes with British goods in the iron markets of this country. Glass of all kinds is also made on the coalfield, and large quantities are sent to the United Kingdom.

Flax is grown, and the stalks are soaked in the River Lys at Courtrai, as the water is free from lime salts. The yarn is thus prepared, and much of it is sent to Belfast to be woven in the linen mills.

Egypt.—Ninety per cent. of the value of the imports consists of raw cotton and cotton seeds.

Argentine is a country of (*a*) vast grass lands suitable for cattle and sheep, (*b*) arable land on which cereals and other crops are grown.

Live cattle are no longer sent from the Argentine to Great Britain, but beef is sent in large quantities; the Argentine is

second only to New Zealand in supplying us with frozen mutton. Wool, tallow, hides and other animal products are also sent. Wheat and maize are now grown in enormous quantities, and the Argentine has become one of the chief sources of the wheat supply of Great Britain. All these articles are exported from Buenos Aires and Rosario. Monte Video in Uruguay is also noted for meat products.

EXERCISES.

1. Compare the articles sent from the Netherlands and Belgium respectively to the United Kingdom. Give reasons for the difference.

2. What articles of food and drink do we obtain from France and Germany respectively? Give some account of the conditions under which these articles are produced.

3. Write an account of the productions of the Argentine.

4. Say what you know of the productive areas of Russia. What articles (of more than one million pounds each in value) does Russia send to Great Britain? Through what Russian ports are they chiefly exported?

5. Write an account of the trade carried on between Great Britain and Denmark.

CHAPTER XVI.

TRADE OF THE UNITED KINGDOM (CONTINUED).

1. Group the articles which we obtain from British India and Ceylon under the following headings :—Cereals, fibres, seeds, tea, rubber and other articles. Write the value of each group and make a percentage table. Draw a diagram to represent the various groups.

2. Find the total value of (*a*) cotton goods, (*b*) woollen goods, (*c*) machinery exported from the United Kingdom to British possessions.

British Possessions.[1] — From different parts of the British Empire, Great Britain obtains a variety of products, the chief of which are (*a*) articles of food such as wheat, frozen mutton, etc., and (*b*) raw materials to be turned into manufactured goods, *e.g.* raw cotton, raw wool, etc.

In return for these things we find that in nearly every case we export the same kind of goods, viz. machinery, iron and steel goods, textiles (mostly cotton goods to a hot country like India, woollen goods to a cold country like Canada); also articles of clothing ready for use, such as wearing apparel, boots and shoes and many others.

British India.—The value of our trade with India (that is, imports and exports taken together) is greater than that of any other British possession. **Wheat** now takes the first place among the articles which we import from India; it

[1] In reading this chapter constant reference should be made to the Imports and Exports in Appendix III., pp. 142-4.

is chiefly grown in the Punjab, and is exported from Karachi.

Tea takes the second place on the list; large quantities are produced on the hill slopes of Assam and are sent away from Calcutta, while tea grown on the Nilghiri hills is exported from Madras.

Jute thrives in the hot lands of the Ganges delta, and rice in the Ganges valley; both are sent from Calcutta.

Raw cotton, cotton seeds, flax seeds are all produced on the Deccan, and are exported from Bombay.

The imports to the United Kingdom from Ceylon consist almost entirely of two articles—tea and rubber.

Of the articles exported from the United Kingdom to India, cotton goods from South Lancashire represent half the total value. To no country in the world do we send so great a quantity of cotton fabrics.

Australia.—The most notable features of Australia are:

(1) grass lands which stretch from the Blue Mountains and Dividing Range to the edge of the desert: the Bathurst plains, Liverpool plains and Darling Downs being noted for sheep farming;

(2) agricultural land in the south-east; wheat is grown up to the 20-inch line of rainfall;

(3) pastoral land with a heavier rainfall than (1), on which cattle are kept in Victoria (Gippsland) for the production of butter and on the eastern margin of Queensland, where cattle are reared for the frozen beef trade;

(4) mining districts, *e.g.* gold and tin in the mountains of New South Wales and Queensland; silver at Broken Hill; copper in South Australia; gold at Kalgoorlie and Coolgardie.

The staple article of import is wool, the value being more than 35 per cent. of the total imports; frozen mutton is another product of the sheep farms.

Rabbits, once looked upon by the farmers as a pest, now provide two articles of commerce—frozen rabbits and rabbit skins.

Wheat is grown chiefly in South Australia, Victoria, and New South Wales; it is exported from Adelaide and Melbourne. Apples are grown in large quantities in Tasmania.

Canada.—The Eastern Provinces, Nova Scotia, New Brunswick, Quebec and Ontario are noted for forest areas

FIG. 54.—Lumbering in Canada. Logs dragged over the snow are being fastened together to form rafts.

and for agricultural districts. Timber is floated down the rivers and lakes and is shipped from ports on the St. Lawrence. Ontario is noted for dairy produce such as cheese, bacon and hams. Apples and other fruits are grown between Lakes Erie and Huron and also in New Brunswick and Nova Scotia.

The value of the wheat is much greater than that of any other article from Canada. The wheat is chiefly grown in

Manitoba and Saskatchewan, Winnipeg being the centre of the wheat trade. Montreal, Quebec, Halifax and St. John are the chief ports of Canada.

New Zealand.—In South Island the Canterbury plains cover a large area on the eastern side of the island. Christchurch is the chief town. On these grasslands the rainfall is 20-40 inches a year, and the conditions are suitable for sheep farming. The value of the wool exceeds that of any other article. The frozen mutton trade (Canterbury lamb) has become of great importance to England; the carcases, frozen by artificial means, are placed in specially prepared cool chambers, and it is thus possible to transport the cargo across the Tropics to this country. Most of the frozen mutton comes to London for distribution.

In North Island dairy farming is very important, butter and cheese being produced in large quantities. Wellington, Auckland and Napier are all connected with this trade.

Kauri gum, the hardened resin of pine trees which flourished ages ago, is dug up in North Island.

Union of South Africa.—On the Great Karroo in Cape Colony sheep are pastured; **wool** from the merino sheep and the mohair goat is sent to the United Kingdom from Cape Town and Port Elizabeth.

In the Eastern part of Cape Colony near King Williamstown are **ostrich farms**; most of the ostrich feathers are sent to the London market.

The minerals of South Africa are very valuable; **gold** from the Witwatersrand near Johannesburg; **diamonds** from Kimberley in Griqualand West; **copper** from Ookiep, near Port Nolloth.

Although wool is the staple product of South Africa, the mining industry has led to the rapid development of the country. Many people have been attracted to South Africa because of the diamond mines and the gold fields; this influx of population has been accompanied by the rapid

extension of railways, and the resources of the country are being opened up in other directions.

EXERCISES.

1. From what parts of the British Empire does Great Britain obtain tea, wool, gold, apples and cheese? Under what conditions are these articles produced?

2. Compare Australia and British South Africa as regards mining, sheep farming, agriculture.

3. What kind of goods does Great Britain chiefly send to her colonies? Explain why they are sent.

4. Draw a sketch map of Australia, and on it mark the chief productive areas and the chief seaports. Shade the desert lands.

5. Say what you know of the sheep-farming industry in New Zealand. Of what importance is this industry to the people of Great Britain?

6. Give the position and importance of:—Auckland, King Williamstown, Gippsland, Ontario, Tasmania and Assam.

APPENDIX I.

CHIEF SEAPORTS OF THE UNITED KINGDOM.

IMPORTS AND EXPORTS.

London (including Queenborough).

Principal Imports.	Value £1000.
Cattle and Sheep	1,650
Apparel	556
Bristles	604
Butter	7,762
Cycles, Motors and parts	4,230
Cheese	3,661
Chemicals	1,490
Cocoa, raw	874
Coffee, raw	1,645
Wheat	8,349
Barley, Oats, Beans, Maize, Meal, etc.	10,036
Cotton, raw	1,685
Cotton Goods	3,892
Drugs, Opium, etc.	1,229
Dye Stuffs (dyeing and tanning)	1,097
Eggs	2,247
Electrical Goods	729
Embroidery and Fancy Goods	1,223
Fish, of all kinds	1,129
Currants and Raisins	1,352
Fruit (apples, bananas, grapes, oranges, etc.)	4,370
Glass	1,183
Gum (arabic, kauri, shellac)	1,649
Hardware	485
Hemp	1,903
Hides, raw	1,343
Hops	794
Instruments, scientific	530
Jute, raw	2,272
Lard	1,075
Leather	5,158
Linen Goods	447
Machinery	2,082
Meat, Bacon and Hams	1,553
Beef, fresh and refrigerated	4,653
Mutton ,, ,,	5,968
Pork ,, ,,	803
Metals and Ores	16,145
Milk, condensed	862
Nuts (for expressing oil)	833
Oil, petroleum, etc.	3,027
Oil, turpentine	536
Oil Seed Cake	546
Painters' Colours	656
Paper and Paper-making Materials	4,412
Plaiting of Straw, etc.	929
Rubber	7,136
Seeds (cotton, flax, soya beans)	3,326
Shells	538
Silk Goods	2,970
Skins and Furs	6,070
Stones and Slates	686
Sugar, refined and unrefined	8,008
Tallow	2,326
Tea	11,702
Tobacco	938
Wine	1,791
Wood and Timber	5,776
Wool, raw	22,192
Woollen Goods	1,698
Total Imports	225,800

London (including Queenborough).

Principal Exports.	Value £1000.
Apparel	2,814
Arms, Ammunition, Stores, etc.	1,965
Beer and Ale	704
Books, printed	1,313
Boots and Shoes	1,439
Cycles, Motors and parts	2,859
Cement	950
Chemicals	1,782
Cotton Goods	8,530
Electrical Goods	2,439
Haberdashery and Millinery	648
Hardware	878
Hats	768
Implements and Tools	595
Scientific Instruments	670
Leather (not boots and shoes)	1,215
Linen Goods	762
Machinery	4,319
Manures	863
Medicines	1,437
Iron and Steel Goods	4,774
Oil Cloth	855
Painters' Colours	1,478
Paper and Paper-making Materials	1,847
Plate and plated wares	535
Rubber Manufactures	629
Skins and Furs	680
Spirits	552
Stationery (other than paper),	943
Sugar, Confectionery, Jam, etc.	816
Tobacco and Snuff	1,037
Wood Manufactures (furniture, etc.)	944
Woollen Goods	5,965
Total Exports of Produce and Manufactures of U.K.	80,200
Motor Cars, Motor Cycles, etc.	482
Coffee, raw	1,625
Cotton, raw	1,260
Drugs, of all sorts	4[illegible]0
Gum, Kauri, etc.	994
Hemp	874
Hides, raw	836
Jute	1,873
Leather	1,439
Metals and Ores	7,199
Rubber	3,328
Silk Goods	913
Skins and Furs	3,849
Tallow	1,645
Tea	1,862
Wool, raw	9,137
Woollen Goods	557
Total Exports of Foreign and Colonial Merchandise	52,200

Liverpool (including Birkenhead and Garston).

Principal Imports.	Value £1000.
Cattle and Sheep	1,504
Cheese	1,173
Chemicals	515
Cocoa, raw	398

Principal Imports.	Value £1000.
Wheat	10,031
Barley, Oats, Beans, Maize, Meal, Flour, etc.	6,030
Cotton, raw	53,967
Dye Stuffs (dyeing and tanning)	746
Fish, of all kinds	1,260
Currants and Raisins	1,110
Fruit (apples, bananas, grapes, oranges, etc.)	2,932
Hemp	747
Hides, raw	1,527
Jute Goods	1,563
Lard	1,579
Leather (not boots and shoes)	2,545
Machinery	819
Bacon and Hams	6,230
Mutton, fresh and refrigerated	2,468
Beef, fresh and refrigerated	4,409
Metals and Ores	9,560
Nuts (for expressing oil)	911
Palm Oil	2,293
Oil Seed Cake	768
Rubber	12,299
Seeds (cotton, flax, soya, etc.)	1,599
Skins and Furs	1,364
Sugar, refined and unrefined	4,449
Tallow	1,198
Tobacco	3,289
Wood and Timber	3,408
Wool, raw	6,906
Oil, petroleum, etc.	674
Silk Goods	567
Total Imports	164,500

Liverpool (including Birkenhead and Garston).

Principal Exports.	Value £1000.
Apparel	1,373
Beer and Ale	569
Carriages, railway, etc.	2,441
Chemicals and Chemical Preparations	4,107
Chinaware and Earthenware	1,847
Cotton Yarn and Waste	4,090
Cotton Goods	56,687
Fish, of all kinds	549
Glass Manufactures	1,054
Hardware	1,202
Hats	567
Implements and Tools	1,133
Leather (not boots and shoes)	774
Linen Goods	3,925
Machinery	10,031
Manures	1,248
Iron and Steel Goods	14,688
Oil Cloth	663
Paper	642
Soap	1,481
Tobacco	797
Woollen Goods	10,070
Total Exports of Produce and Manufactures of U.K.	144,900
Cotton, raw	6,397
Feathers, ornamental	697
Jute Manufactures	1,316
Palm Oil	1,420
Rubber	7,467
Wool, raw	2,017
Total Exports of Foreign and Colonial Merchandise	27,800

Hull.

Principal Imports.	Value £1000.
Butter	3,223
Wheat	7,866
Barley, Oats, Beans, Maize, Meal, Flour, etc.	3,068
Cotton, raw	769
Dye Stuffs (dyeing and tanning)	559
Eggs	1,454
Fish, of all kinds	655
Fruit (oranges, lemons, etc.)	629
Hides, raw	642
Lard	518
Machinery	631
Margarine	810
Bacon and Hams	1,072
Metals and Ores	1,493
Paper and Paper-making Materials	937
Seeds (cotton, flax, soya, etc.)	6,169
Sugar, refined	1,094
Wood and Timber	1,967
Wool, raw	1,590
Total Imports	42,900

Principal Exports.	Value £1000.
Coal, Coke, Manufactured Fuel	1,726
Cotton Yarn	1,877
Cotton Goods	2,496
Machinery	3,476
Iron and Steel Goods	1,517
Oil	1,168
Wool, sheep's or lambs'	663
Woollen and Worsted Yarn	2,149
Woollen Goods	978
Total Exports of Produce and Manufactures of U.K.	24,600
Cotton, raw	1,003
Hides	471
Machinery	469
Rubber	534
Total Exports of Foreign and Colonial Merchandise	5,400

Manchester.

Principal Imports.	Value £1000.
Wheat	3,246
Raw Cotton	13,314
Lard	816
Leather	403
Metals and Ores	2,149
Oil, petroleum, etc.	687
Paper and Paper-making Materials	1,300
Sugar, refined	950
Wood and Timber	1,394
Total Imports	31,600

Principal Exports.	Value £1000.
Cotton Yarn and Waste	3,335
Cotton Goods	9,896
Machinery	1,782
Iron and Steel Goods	577
Woollen Goods	498
Total Exports of Produce and Manufactures of U.K.	18,500
Foreign and Colonial Merchandise	300

Southampton (including Lymington).

Principal Imports.	Value £1000.
Butter	1,793
Cocoa, raw	376
Coffee, raw	601
Feathers, ornamental	2,000
Fruit (apples, bananas, oranges, etc.)	591
Bacon and Hams	502
Beef, fresh and refrigerated	1,906
Metals and Ores	465
Silk Goods	549
Skins and Furs	1,427
Vegetables, raw	589
Wool, raw	2,745
Total Imports	22,000

Principal Exports.	Value £1000.
Apparel	2,370
Books, printed	521
Boots and Shoes	855
Cotton Goods	5,097
Machinery	497
Woollen Goods	1,501
Total Exports of Produce and Manufactures of U.K.	18,000
Cotton Manufactures (lace, etc.)	924
Rubber	1,558
Skins and Furs	349
Wool, sheep's or lambs'	835
Total Exports of Foreign and Colonial Merchandise	6,800

APPENDIX II.

TRADE OF THE UNITED KINGDOM.

FOREIGN COUNTRIES.

United States of America.

Articles Imported into the United Kingdom from the United States of America.	Value £1000.
Wheat	6,323
Maize	1,997
Wheatmeal and Flour	2,964
Fish, of all kinds	686
Fruit, canned or bottled	489
Apples, raw	816
Lard	4,288
Bacon and Hams	7,718
Beef, fresh and refrigerated	858
Cotton Seed Oil	560
Glucose	578
Tobacco	3,341
Cotton, raw	48,512
Petroleum, lamp oil	1,463
Petroleum, lubricating oil	1,364
Turpentine	780
Resin	622
Skins and Furs	1,496
Wood and Timber	3,600
Leather	4,050
Machinery	2,755
Copper, unwrought	3,172
Oil Seed Cake	600
Paraffin Wax	838
Wood Manufactures (furniture, house frames, etc.)	942
Total Value of Imports	124,000

Articles Exported from the United Kingdom to the United States of America.	Value £1000.
Spirits, British and Irish	550
Wool, sheep's or lambs'	847
Books, printed	485
Chemicals	1,256
Cotton Goods	3,110
Jute Manufactures	1,014
Linen Goods	4,074
Machinery	913
Manures	923
Iron and Steel Goods	2,316
Tin, unwrought	671
Woollen and Worsted Goods	1,508
Total Exports of Produce and Manufactures of United Kingdom	29,697
Cotton, raw	3,989
Feathers, ornamental	706
Gum (arabic, kauri, shellac)	592
Hides, raw	823
Palm Oil	509
Rubber	4,680
Skins and Furs	2,207
Wool, raw	3,421
Cotton Manufactures (lace, etc.)	1,039
Jute Manufactures	829
Copper, unwrought	820
Tin (in blocks, ingots, etc.)	4,714
Total Exports of Foreign and Colonial Merchandise	30,846

Germany.

Articles Imported into the United Kingdom from Germany.	Value £1000.
Oats	710
Sugar, refined	5,034
Sugar, unrefined	3,304
Wood and Timber	670
Apparel	1,167
Cycles, Motor Cars and Cycles	1,184
Chemicals	1,485
Chinaware, Earthenware	610
Cotton Piece Goods (including book cloth)	1,585
Gloves	584
Hosiery	1,625
Lace	1,337
Trimmings	601
Dyes (obtained from coal tar)	1,624
Embroidery and Needlework	588
Fancy Goods and Artificial Flowers	830
Glass (window, plate, flint, bottle, etc.)	999
Hardware	811
Leather	1,611
Leather Manufactures (gloves, etc.)	952
Machinery (electrical, sewing machines, etc.)	1,741
Steel (ingots, bars, etc.)	1,887
Iron and Steel Goods	2,644
Zinc, crude	1,078
Musical Instruments (pianos, etc.)	704
Painters' Colours	822
Paper (printing, packing, millboard)	1,315
Silk Goods	2,086
Toys and Games	1,021
Woollen Manufactures (woollens, flannels, hosiery, carpets, etc.)	2,151
Total Imports	63,000

Articles Exported from the United Kingdom to Germany.	Value £1000.
Fish (herrings, etc.)	2,339
Coal (coke, etc.)	4,401
Cotton Waste and Yarn	4,852
Cotton Goods	2,801
Leather	606
Machinery	1,902
Iron and Steel Goods	1,709
Woollen and Worsted Yarn, of all kinds	5,103
Woollen Goods	2,129
Total Exports of Produce and Manufactures of United Kingdom	37,000
Coffee, raw	531
Rubber	3,264
Skins and Furs	2,086
Wool, sheep's or lambs'	4,059
Leather	600
Total Exports of Foreign and Colonial Merchandise	17,000

France.

Articles Imported into the United Kingdom from France.	Value £1000.
Butter	1,765
Eggs	376
Fruit, raw	1,223
Oil, coco-nut	519
Brandy	850
Vegetables, raw	768
Sugar	643
Wine	2,906
Feathers, ornamental	582
Wood and Timber	734
Wool, sheep's or lambs'	1,611
Apparel	1,939
Cycles, Motor Cars and Cycles	2,607
Cotton, lace	1,152
Fancy Goods (Paris goods)	371
Flowers, artificial	689
Leather	689
Gloves	579
Silk Manufactures (broad stuffs)	4,096
Silk, lace	277
Silk, ribbons	631
Woollen Yarn	1,004
Woollen Goods	3,563
Total Imports	44,000

Articles Exported from the United Kingdom to France.	Value £1000.
Coal, Coke, etc.	5,679
Cycles, Motor Cars and Cycles	444
Chemicals	959
Cotton Waste and Yarn	748
Cotton Goods	771
Machinery	2,048
Iron and Steel Goods	1,236
Woollen Goods	1,664
Total Exports of Produce and Manufactures of United Kingdom	23,000
Feathers, ornamental	611
Jute	521
Rubber	1,926
Skins and Furs	688
Wool, sheep's or lambs'	3,592
Total Exports of Foreign and Colonial Merchandise	11,000

Russia.

Articles Imported into the United Kingdom from Russia.	Value £1000.
Butter	3,004
Wheat	7,793
Barley	2,161
Oats	1,945
Maize	1,261
Eggs	3,489
Sugar	902
Flax	2,095
Hemp	356
Hides, raw	396
Petroleum	578
Flax Seed (linseed)	634
Wood and Timber	10,004
Total Imports	42,000

Articles Exported from the United Kingdom to Russia.	Value £1000.
Herrings	1,365
Coal, Coke, etc.	2,112
Cotton Goods	636
Machinery	2,826
Iron and Steel Goods	800
Woollen Yarn	653
Woollen Goods	287
Total Exports of Produce and Manufactures of United Kingdom	13,000
Tea	343
Cotton, raw	3,365
Rubber	1,702
Tallow	965
Total Exports of Foreign and Colonial Merchandise	8,000

Denmark.

Articles Imported into the United Kingdom from Denmark.	Value £1000.
Butter	10,078
Eggs	1,851
Bacon	6,667
Total Imports	20,000

Articles Exported from the United Kingdom to Denmark.	Value £1000.
Coal, Coke, etc.	1,616
Cotton Goods	445
Iron and Steel Goods	395
Woollen Goods	224
Total Exports	6,000

Netherlands.

Articles Imported into the United Kingdom from the Netherlands.	Value £1000.
Butter	720
Cheese	616
Cocoa, prepared	470
Eggs	297
Margarine	2,654
Pork, fresh, refrigerated and salted	864
Mutton, fresh and refrigerated	365
Milk, condensed	911
Sugar	2,540
Plants, Shrubs, Flower Roots	372
Paper (printing, packing strawboard)	1,032
Starch	289
Total Imports	19,000

Articles Exported from the United Kingdom to the Netherlands.	Value £1000.
Coal, Coke, etc.	1,144
Cotton Yarn	1,830
Cotton Goods	1,183
Machinery	570
Iron and Steel Goods	1,320
Woollen Goods	612
Total Exports of Produce and Manufactures of U.K.	13,000
Coffee	384
Palm Oil	297
Rubber	446
Tallow	316
Wool, sheep's or lambs'	346
Tin (blocks, ingots, bars, etc.)	443
Total Exports of Foreign and Colonial Merchandise	5,000

Belgium.

Articles Imported into the United Kingdom from Belgium.	Value £1000.
Sugar	1,110
Flax	1,279
Cycles, Motor Cars and Cycles	632
Cotton Manufactures (including book cloth)	339
Glass (window, plate, flint, bottles)	1,327
Linen Yarn	781
Linen Manufactures	500
Iron and Steel Goods	2,553
Zinc	1,195
Woollen and Worsted Yarn	1,346
Total Imports	21,000

Articles Exported from the United Kingdom to Belgium.	Value £1000.
Fish, of all sorts	371
Coal, Coke, etc.	735
Cotton Waste and Yarn	423
Cotton Goods	1,060
Machinery	1,005
Iron and Steel Goods	906
Woollen Goods	650
Total Exports of Produce and Manufactures of U.K.	11,000
Cotton, raw	543
Jute	400
Rubber	557
Wool, sheep's or lambs'	2,842
Total Exports of Foreign and Colonial Merchandise	7,000

Egypt.

Articles Imported into the United Kingdom from Egypt.	Value £1000.
Eggs	253
Onions	264
Cotton, raw	17,911
Cotton Seeds	2,348
Oil Seed Cake	373
Total Imports	22,000

Articles Exported from the United Kingdom to Egypt.	Value £1000.
Coal, Coke, etc.	1,873
Cotton Goods	3,608
Machinery	419
Iron and Steel Goods	601
Total Exports	9,000

Argentine.

Articles Imported into the United Kingdom from the Argentine.	Value £1000.
Butter	327
Wheat	7,241
Oats	1,586
Maize	5,371
Beef, fresh and refrigerated	8,919
Mutton, ,, ,,	2,504
Meat, preserved	927
Tallow	1,103
Hides, raw	534
Flax Seed (linseed)	1,312
Wool, sheep's or lambs'	1,767
Total Imports	33,000

Articles Exported from the United Kingdom to the Argentine.	Value £1000.
Coal, Coke, etc.	2,274
Carriages (railway, etc.)	1,154
Cotton Goods	3,453
Machinery	1,741
Iron and Steel Goods	3,719
Woollen Goods	1,465
Total Exports	20,000

APPENDIX III.

TRADE OF THE UNITED KINGDOM.

BRITISH POSSESSIONS.

British India (exclusive of Straits Settlements and Ceylon).

Articles Imported into the United Kingdom from British India.	Value £1000.
Wheat	8,298
Rice and Rice Meal	1,979
Tea	6,618
Cotton, raw	1,932
Jute, raw	5,867
Cotton Seeds	1,501
Flax Seeds or Linseed	2,128
Skins and Furs	624
Wood and Timber	578
Wool, sheep's or lambs'	1,527
Jute Manufactures	2,058
Leather	2,604
Total Imports	44,000
Ceylon.	
Tea	3,979
Rubber	1,160
Total Imports	6,000

Articles Exported from the United Kingdom to British India.	Value £1000.
Railway Carriages	549
Cycles, Motor Cars and Cycles	578
Cotton Yarn	2,036
Cotton Goods	25,375
Machinery	3,508
Copper, wrought and unwrought	982
Iron and Steel Goods	5,715
Woollen Goods	1,040
Paper, of all sorts	394
Total Exports	51,000

Australia (including Tasmania).

Articles Imported into the United Kingdom from Australia.	Value £1000.
Butter	3,351
Wheat	5,341
Wheatmeal and Flour	284
Fruit (apples, pears, etc.)	407

Articles Exported from the United Kingdom to Australia.	Value £1000.
Spirits, British and Irish	693
Apparel	818
Arms, Ammunition, Stores	719
Books, printed	542

Articles Imported into the United Kingdom from Australia.	Value £1000.
Beef, fresh and refrigerated	1,045
Mutton, ,, ,,	2,020
Rabbits, ,, ,,	483
Hides, raw	361
Gold Ore	345
Silver Ore	298
Skins and Furs (sheep, rabbits, etc.)	1,677
Preserved Meat (not salted)	679
Tallow	1,510
Wool, sheep's or lambs'	13,760
Leather	395
Copper, unwrought	1,228
Lead (pig and sheet)	803
Tin (blocks, ingots, etc.)	647
Total Imports	37,000

Articles Exported from the United Kingdom to Australia.	Value £1000.
Cycles, Motor Cars and Cycles	878
Chemicals	571
Cotton Goods	4,345
Hardware	325
Linen Goods	599
Machinery	2,006
Iron and Steel Goods	5,018
Oil Cloth	527
Paper, of all sorts	624
Ships and Boats (with machinery)	624
Woollen Goods	2,506
Total Exports	31,000

Canada.

Articles Imported into the United Kingdom from Canada.	Value £1000.
Cheese	4,471
Wheat	7,337
Wheatmeal and Flour	1,685
Fish, of all kinds	957
Apples, raw	816
Bacon and Hams	1,626
Wood and Timber	3,448
Total Value of Imports	26,000

Articles Exported from the United Kingdom to Canada.	Value £1000.
Spirits, British and Irish	542
Apparel	587
Chemicals	381
Cotton Goods	2,368
Linen Goods	621
Machinery	619
Iron and Steel Goods	2,156
Woollen Goods	3,559
Total Exports	22,000

New Zealand.

Articles Imported into the United Kingdom from New Zealand.	Value £1000.
Butter	1,779
Cheese	1,379
Beef, fresh and refrigerated	565
Mutton, ,, ,,	4,055
Gum, kauri	623

Articles Exported from the United Kingdom to New Zealand.	Value £1000.
Apparel	562
Cycles, Motor Cars and Cycles	373
Cotton Goods	986
Machinery	486

Articles Imported into the United Kingdom from New Zealand.	Value £1000.
Skins and Furs (sheep and rabbit)	692
Tallow	731
Wool, sheep's and lambs'	7,660
Total Imports	19,000

Articles Exported from the United Kingdom to New Zealand.	Value £1000
Iron and Steel Goods	1,411
Woollen Goods	644
Total Exports	10,000

Union of South Africa.

Articles Imported into the United Kingdom from	Value £1000.
I. Cape of Good Hope.	
Feathers, ornamental	1,954
Skins and Furs (goat, sheep, seal)	918
Wool (mohair)	798
Wool, sheep's or lambs'	3,083
Metal Manufactures (copper, etc.)	433
Total Imports	7,851
II. Natal.	
Hides, raw	267
Wool, raw	1,117
Total Imports	2,120
III. Transvaal.	
Total Imports	375

Articles Exported from the United Kingdom to	Value £1000.
I. Cape of Good Hope.	
Apparel	1,231
Boots and Shoes	466
Cotton Goods	974
Machinery	414
Iron and Steel Goods	876
Woollen Goods	480
Total Exports	8,977
II. Natal.	
Cotton Goods	352
Machinery	589
Iron and Steel Goods	746
Total Exports	4,876
III. Transvaal.	
Apparel	947
Boots and Shoes	351
Cotton Goods	485
Machinery	584
Iron and Steel Goods	638
Woollen Goods	272
Total Exports	6,189

EXAMINATION QUESTIONS.

The following questions are taken from examination papers of the Society of Arts (S.A.), the Lancashire and Cheshire Union of Institutes (L.C.U.I.) and the Civil Service Commission (C.S.C.).

1. Locate, and account for, the "cotton-belt" of the United States. (S.A.)

2. State, and account for, the distribution of cacao, cinchona, flax, and wheat in South America. (S.A.)

3. What geographical conditions make the North Atlantic route the most important of all ocean routes. (S.A.)

4. Discuss the influence of (*a*) site and (*b*) relief on the economic development of the Argentine. (S.A.)

5. Locate the chief areas in Continental Europe that produce respectively coal, flax, and coniferous forests, accounting in each case—so far as you can—for the particular product being in the particular place. (S.A.)

6. What great changes in transport-routes will be introduced by the Panama Canal? And why? (S.A.)

7. Locate, and account for, the "grain" and "meat" belts of the Argentine, naming their ports. (S.A.)

8. Locate, account for, and compare the value of, the various areas in North America which are covered with coniferous forests. (S.A.)

9. Describe fully the position, and account for the importance of, the *chief* trans-continental railways of Canada? (S.A.)

10. Give an account of the industries based on any *one* of the coalfields of Britain, and explain the growth of these industries there. (S.A.)

11. What commodities are manufactured from flax? Where in Britain are these manufactured? What conditions favour the growth of flax? In what foreign lands is flax largly grown? By what routes are the raw materials sent to Britain? (S.A).

12. Describe the chief activities of the people of England east and south of a line from Hull to Exeter, and show why this line is of importance. (S.A.)

13. From what lands are our greatest supplies of tea sent? Show how the temperature, rainfall, relief, and any other geographical conditions are favourable. To what special port in Britain is tea sent? (S.A.)

14. Discuss the relative value of the different routes by which wheat from Central North America might be sent to Britain. (S.A.)

15. What are the chief articles of commerce between Great Britain and Australia? Explain the causes which lead to the exchange of these commodities. (S.A.)

16. From what parts of the world do we obtain supplies of (*a*) copper, (*b*) eggs, (*c*) silk? Explain carefully by what routes these products respectively reach us. (S.A.)

17. Give a short description of the course of a vessel from England to Japan, going out by the Eastern, and returning by the Western route. (L.C.U.I.)

18. Classify the various modes of transport now in use. Give illustrations of each by reference to the different districts of Africa. (L.C.U.I.)

19. Name the principal ship canals or isthmian canals of the world, and say in what their value consists. (L.C.U.I.)

20. What are the principal kinds of goods exchanged between Great Britain and each of the following countries:—Canada, the United States, Brazil, Argentine Republic, France, Germany, Egypt? (L.C.U.I.)

21. Name any towns in Great Britain connected with the manufacture of carpets, lace, pottery, blankets, paper. (L.C.U.I.)

22. In what parts of England and Wales is coal mining carried on extensively? Name any other mineral products which are obtained on or near the coalfields. (L.C.U.I.)

23. What are the principal classes of goods imported into Britain from any *six* of the following countries:—France, Germany, Russia, China, Japan, Congo State, United States, Central America, Brazil? (L.C.U.I.)

24. From what places do we import our supplies of the following:—Wheat, raw cotton, frozen meat, silk goods, timber for building, ornamental woods? (L.C.U.I.)

25. Draw a sketch map of Yorkshire showing the three belts into which it is usually divided as connected with (*a*) iron industry, (*b*) rearing of cattle and crops, (*c*) manufacturing. Mention the principal towns in each belt. (L.C.U.I.)

26. What raw materials do British manufacturers obtain from India? Under what conditions are these materials produced in India? Where are they manufactured in Great Britain? What becomes of the manufactured articles? Point out the importance of Bombay and Calcutta as centres of industry and trade. (C.S.C.)

27. In different parts of Africa goods are carried, (*a*) by natives, (*b*) on camels, (*c*) in ox waggons, (*d*) on railways, (*e*) in river boats.

In what regions are these various methods of transport used, and what conditions render them necessary?

What goods are generally transported in each of these ways? (C.S.C.)

28. Describe the position of the industrial areas of North America (east of the Rocky Mountains) devoted to lumber, fur, cotton, wheat. Explain why each district is specially suited to its particular industry. (C.S.C.)

29. Give a short description of the surface and drainage of Australia, showing the districts specially suitable for particular industries. (L.C.U.I.)

30. Give a list of the chief towns of New Zealand, with the position and commercial importance of each. (L.C.U.I.)

31. Account for the following facts :—

(*a*) that South Lancashire is so suitable for the manufacture of cotton goods ;

(*b*) that the Clyde estuary is an important seat of the shipbuilding industry ;

(*c*) that Belfast is an important seat of the linen industry. (C.S.C.)

32. In what parts of the British Isles is wheat grown? From what countries is wheat imported into England? How is it that foreign wheat can compete so successfully with home-grown wheat?

33. Describe briefly how tea, cane sugar and beet sugar are produced. Explain why cane sugar is consumed in the British Isles, while beet sugar is almost exclusively used on the continent of Europe. (C.S.C.)

34. Name an important raw material used in each of the following manufactures :—Paper, ships, linen, porcelain, carpets. Describe each of these materials, and say where it is produced or obtained. Where are the above-named manufactures carried on in the British Isles? (C.S.C.)

35. Name five different raw materials commonly used to make clothing. In the case of any two say where the raw material mainly comes from, and how it is made into the finished garment. (C.S.C.)

36. The Humber and mouth of the Thames are important estuaries on the east coast of England. What estuaries on the west coast are respectively opposite these? What trade is carried on through the ports on each of the four estuaries referred to? (C.S.C.)

37. Describe the position of the Suez Canal and of the Manchester Ship Canal. State the object of constructing each canal, and the commercial importance of each. (C.S.C.)

38. Mention one important district for the production of each of the following oils :—Petroleum, olive, cod-liver, linseed.

In what circumstances are they obtained, and to what uses are they put? (C.S.C.)

39. Mention *one* British seaport connected with each of the following kinds of trade :—(*a*) Baltic, (*b*) American, (*c*) West Indian, (*d*) New Zealand.

Explain the suitability of the port for the particular trade, and say what articles form the bulk of the trade. (C.S.C.)

40. Describe the conditions under which the following live :—

(*a*) A Canadian wheat-grower ;

(*b*) An Australian sheep-farmer.

Point out the advantages which Canada offers for wheat growing and Australia for sheep farming. (C.S.C.)

41. Two men wish to travel from London to Japan, one by the Trans-Siberian Railway route, the other by the Canadian Pacific route.

Describe the two routes with special reference to the railway section of each. (C.S.C.)

42. From what parts of the British Empire are the following articles obtained :—Gold, raw wool, tea, wheat?

In each case give an account of the conditions under which the article is produced. (C.S.C.)

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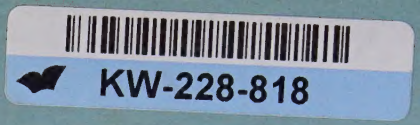
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